

PROJECT: 44-02

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EXTENT OF DEGRADATION INVESTIGATION REPORT  
AND  
REMEDIAL ACTION PLAN  
SAFETY-KLEEN CORP. SERVICE CENTER  
PEKIN, ILLINOIS  
ILD 093862811

December 15, 1994

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Submitted by:

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**EPA - SOL  
PERMIT SECTION**



**TriHydro Corporation**

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## CHAPTER 1.0

### INTRODUCTION

Safety-Kleen Corp. (S-K) has operated a branch service center in Pekin, Illinois since April 1976. The facility is operated as a service center for the distribution and storage of mineral spirits, spent mineral spirits, dry cleaning chemicals, and other parts cleaning solvents. The Pekin Service Center is an integral part of a distribution/recycling network and does not include disposal facilities.

S-K commenced closure of the RCRA underground storage tank (UST) system at this facility in July 1991. As part of closure, S-K conducted an investigation to determine the extent of soil and ground-water impacts caused by prior releases from the UST system. This investigation was conducted in accordance with S-K's "Extent of Degradation Investigation Workplan," dated September 14, 1993, as approved with conditions by the Illinois Environmental Protection Agency (IEPA) by letter dated April 11, 1994. The results of the soil and ground-water quality investigation are presented in this report, along with a proposed plan to remediate the impacts to acceptable levels.

#### 1.1 Facility Identification

Name:	Safety-Kleen Corp. Pekin Service Center
Facility Location:	14249 - VFW Road Pekin, IL 61554
Mailing Address:	Safety-Kleen Corp. 1000 N. Randall Road Elgin, IL 60123-7857
Facility Telephone No.:	(309) 346-1818
USEPA ID No.:	ILD 093 862 811
IEPA ID No.:	179 060 0011 Tazewell County
Contact for Closure:	Robert Schoepke
Contact Telephone No.:	(708) 697-8460

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Geographic Location: Lat.: 40° 31' 51" N  
Long.: 89° 39' 38" W  
Township 24N, Range 5E  
Section 15 (NW¼ of SW¼)

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### 1.2 Status of Facility Closure Activities

Following commencement of closure in July 1991, S-K presented the results of closure activities completed to date to IEPA in the "Partial Facility Closure Progress Report, Safety-Kleen Corp. Service Center, Pekin, Illinois," dated October 14, 1991. IEPA approved this progress report as a closure plan modification request in a letter dated January 14, 1992.

The IEPA approval letter dated January 14, 1992, included conditions and established clean-up objectives for the closure activities associated with one underground hazardous waste storage tank. S-K appealed the conditions/clean-up objectives to the Illinois Pollution Control Board (IPCB) under Docket No. 92-29.

Progress toward resolution of the conditions under appeal was shown in a letter from IEPA dated August 11, 1993 (see Appendix A). Because of the progress, S-K withdrew its permit appeal. The matter was dismissed by the IPCB on August 26, 1993.

In response to Condition 5 of the August 11, 1993 IEPA letter, Safety-Kleen Corp. (S-K) submitted the Extent of Degradation Investigation Workplan for the S-K service center in Pekin, Illinois, on September 14, 1993. The Extent of Degradation (EOD) Workplan was approved with conditions by IEPA in a letter dated April 11, 1994. S-K notified IEPA by letter dated September 23, 1994, that ground-water quality may be impacted by prior releases from the UST system, and that it had proceeded with a ground-water quality investigation to define the extent of impacts.

### 1.3 Facility Description

The Pekin Service Center is located at 14249 VFW Road in an agricultural area south of Pekin, Illinois. The location of the facility is shown on Figure 1-1. The general layout of the site prior to closure of the UST system is shown on figures 1-2 and 1-3.

The hazardous waste management unit undergoing closure at the Pekin Service Center is a 12,000-gallon spent mineral spirits UST and associated appurtenances and piping. A second 12,000-gallon UST which had been used to store product mineral spirits was also present prior to initiation of closure. The product tank was not a hazardous waste management unit. However, the product UST system was removed



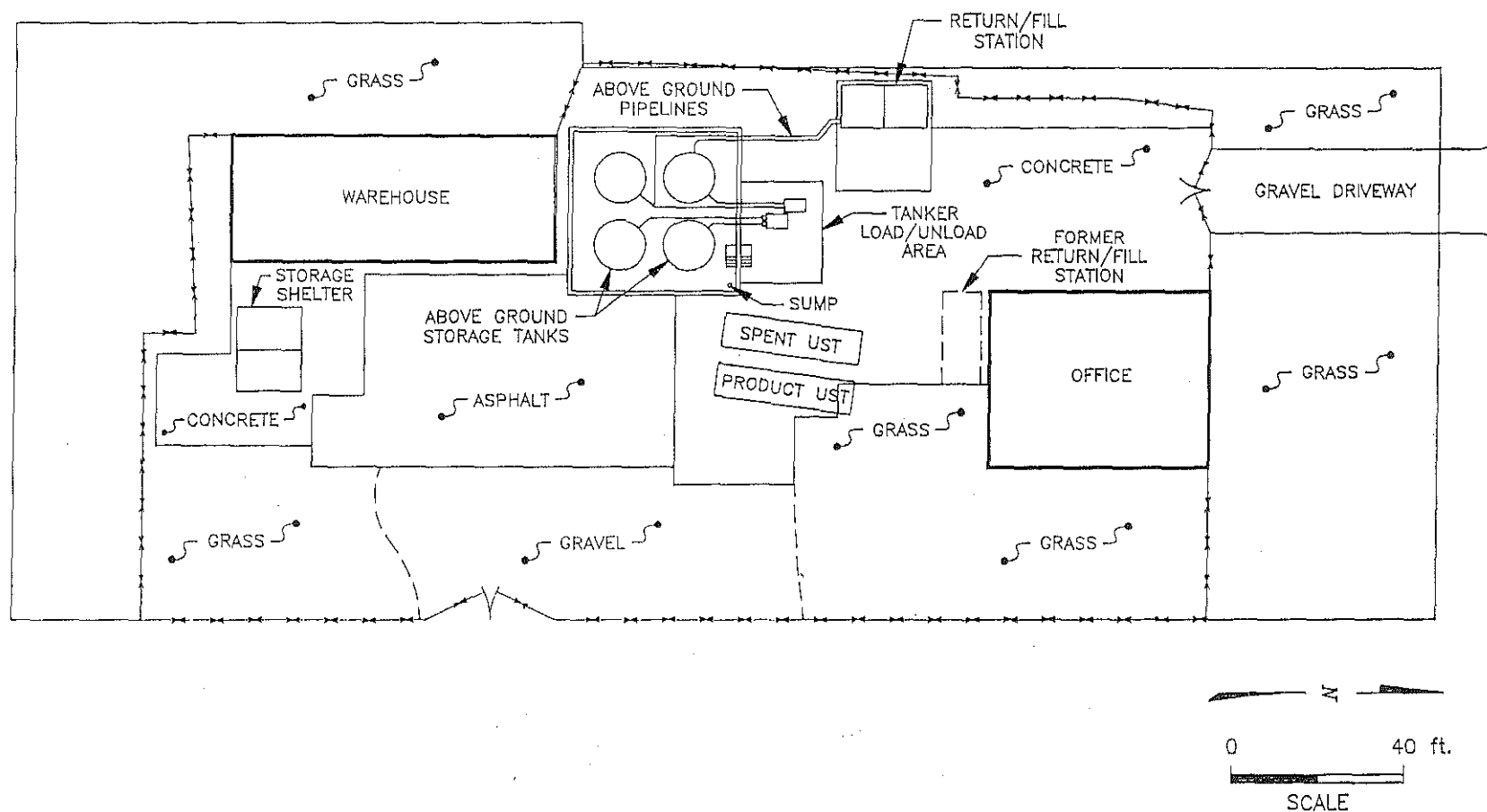


FIGURE 1-2 :GENERAL PRE-CLOSURE SITE LAYOUT, SAFETY-KLEEN CORP. SERVICE CENTER, PEKIN, ILLINOIS (August 1991)

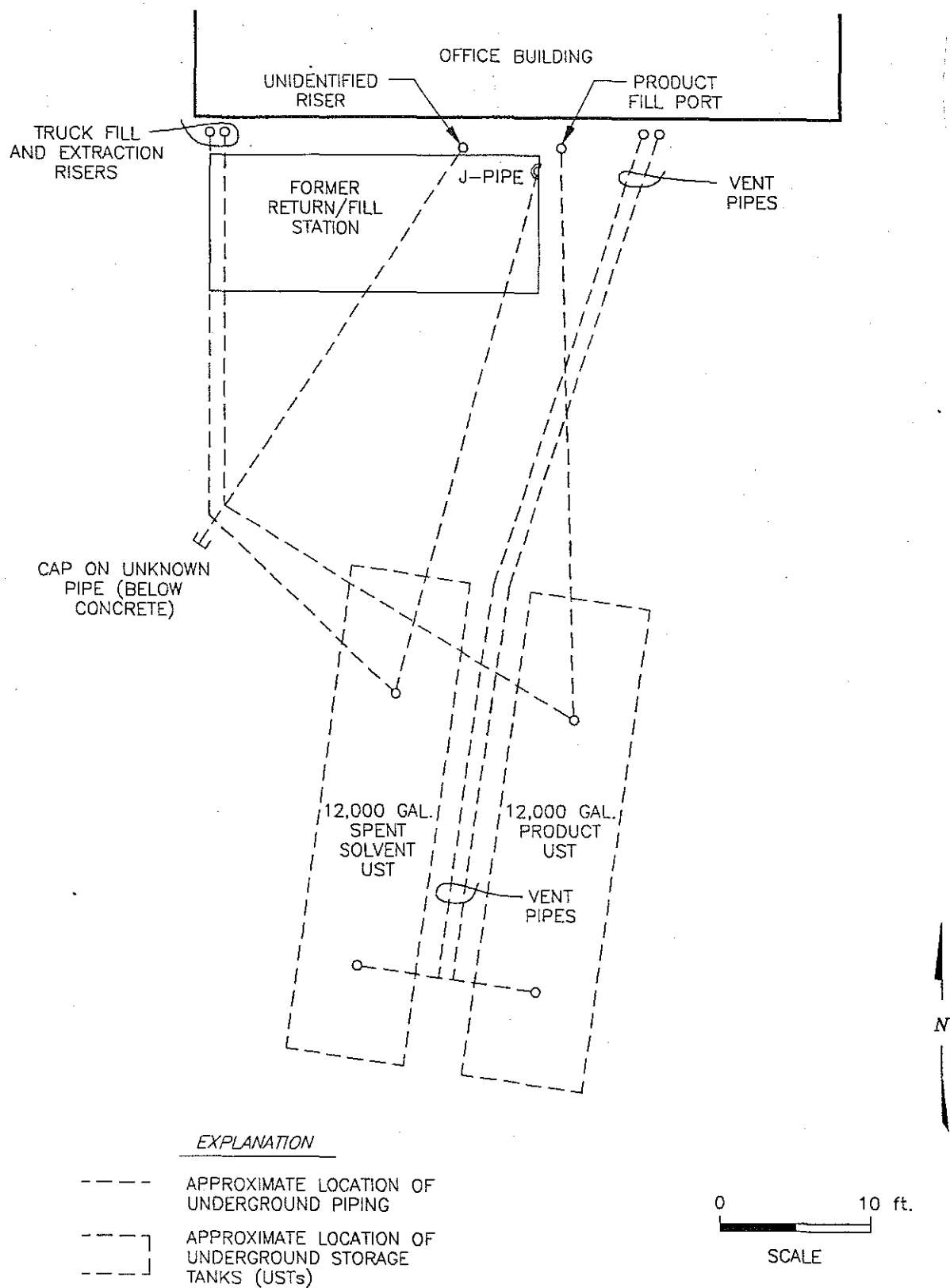


FIGURE 1-3 :GENERAL LAYOUT, FORMER UST SYSTEMS AND PIPING, SAFETY-KLEEN CORP. SERVICE CENTER, PEKIN, ILLINOIS (August 1991)



in the same manner as the spent mineral spirits UST and in accordance with Illinois Environmental Protection Agency (IEPA) UST Program regulations (35 IAC Part 731).

In 1993, S-K filed a siting permit application with IEPA to build an expansion to the Pekin Service Center. IEPA granted a permit, and construction was completed in 1994. A current site map of the expanded facility is shown on Figure 1-4.

#### 1.4 Closure Activities Completed To Date

S-K commenced closure of the hazardous waste management units at the Pekin Service Center on July 25, 1991, in accordance with a closure plan modification request approved by IEPA with conditions in correspondence dated July 9, 1991. The results of the closure activities completed to date were presented to IEPA in the "Partial Facility Closure, Progress Report, Safety-Kleen Corp. Service Center, Pekin, Illinois," dated October 14, 1991. In summary, closure activities which had been completed at the Pekin Service Center prior to this EOD investigation included:

1. Permitting and notifications;
2. Remediation contractor selection;
3. Pre-excavation soil sampling and analysis;
4. UST systems decontamination and removal; and
5. Pipe run soil sampling and analysis.

Following removal of the USTs, the excavation was backfilled with clean sand and finished with a reinforced concrete pad to match surrounding site conditions.

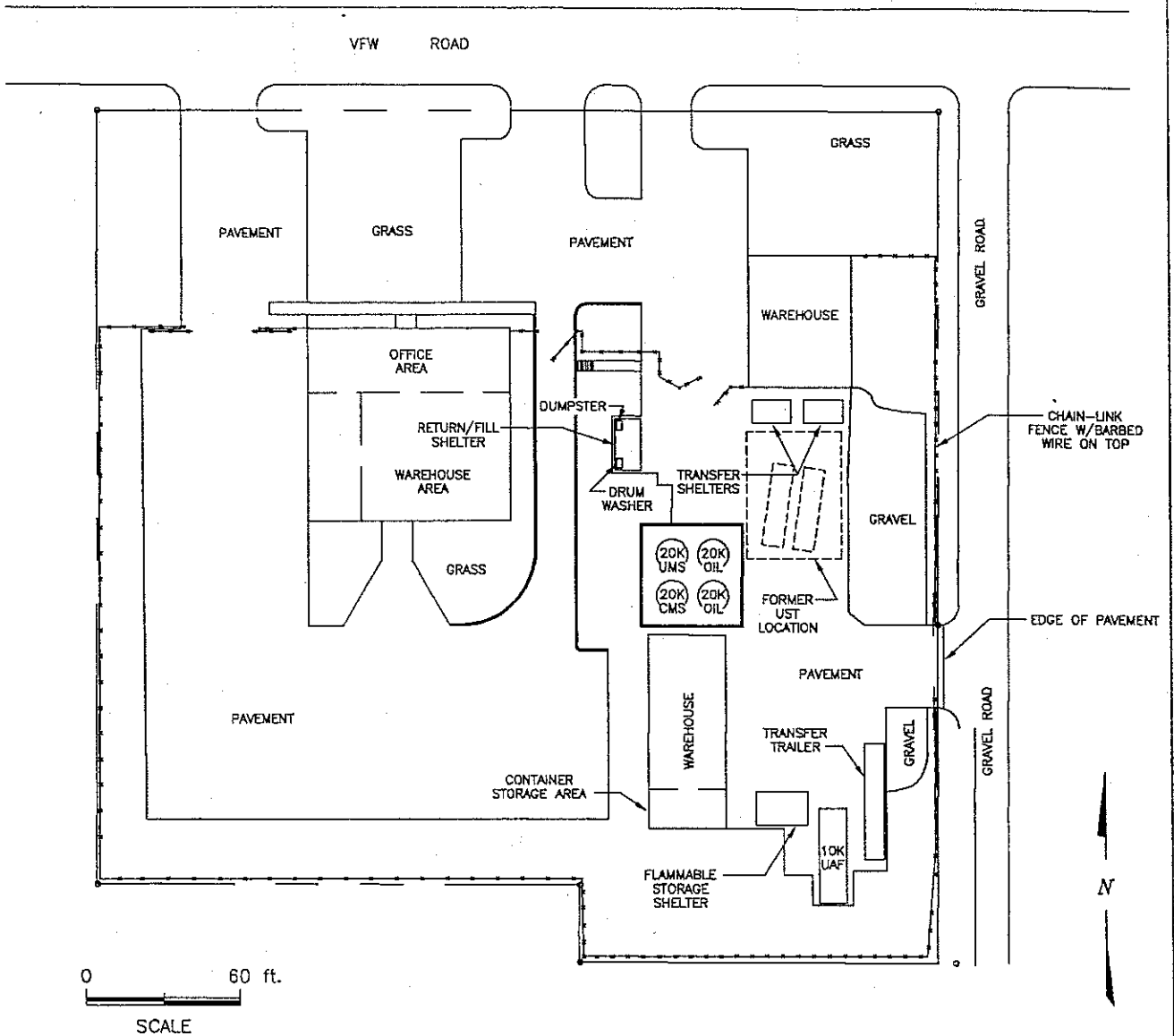


FIGURE 1-4 :CURRENT SITE PLAN, SAFETY-KLEEN CORP. SERVICE CENTER, PEKIN, ILLINOIS

## CHAPTER 2.0

### EXTENT OF DEGRADATION INVESTIGATION PROCEDURES

The Extent of Degradation (EOD) Investigation was completed in accordance with the Workplan dated September 14, 1993, approved by IEPA with conditions on April 11, 1994. All field activities were performed between August 8 and 20, 1994. Photodocumentation of the field activities is presented in Appendix B. The EOD activities were:

- Installation of 13 boreholes with a hydraulic probe rig for soil sampling to define the extent of degradation.
- Installation of four (4) boreholes with a hydraulic probe rig for the collection of background soil samples.
- Field screening of soils for total organic vapor (TOV) with a photoionization detector (PID).
- Analysis by the Safety-Kleen (S-K) Environmental Laboratory of soil samples which appeared to define the extent of degradation, based on field screening, for compounds on the IEPA target list.
- Analysis of background soil samples for target metals by the S-K Environmental Laboratory.
- Installation of one (1) up-gradient and four (4) down-gradient monitoring wells with a hollow stem auger rig to define the lateral extent of ground-water quality degradation.
- Well development and sampling of ground water in the five (5) newly installed monitoring wells.
- Analysis by the S-K Environmental Laboratory of the five (5) ground-water samples and associated QA/QC samples for the compounds on the IEPA target list.

The procedures followed for these activities are detailed in this chapter.

#### 2.1 Soil Sampling Procedures

Soil sampling was conducted to establish background conditions and to define the lateral and vertical extent of soil degradation. Previous site assessment data were used to site boreholes in the vicinity of the former USTs and associated piping.

### 2.1.1 Sampling Locations and Depths

S-K installed four boreholes for the collection of background samples. The locations of these boreholes are presented on Figure 2-1. The background samples were used to establish the background concentrations of inorganic constituents only. The background boreholes were located in areas not affected by facility operations, and were installed after the extent of degradation had been defined, based on field observations.

Background sampling depths were selected in order to establish background concentrations in the two major soil/lithology types encountered at the site. Four background soil samples were selected in each of the two soil types encountered:

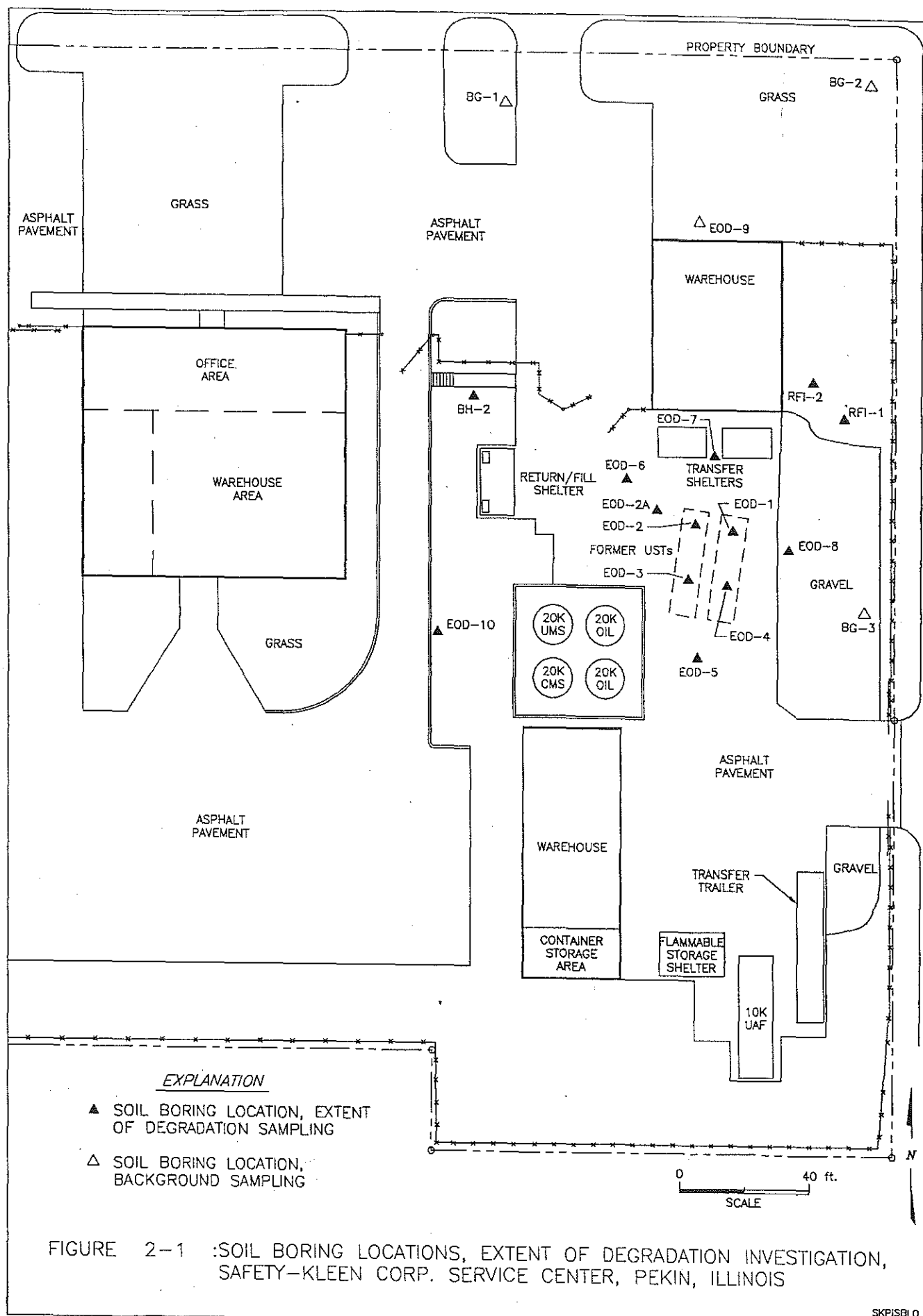
- 1) Silt loam extending from the surface to an average of approximately 3 feet; and
- 2) Coarse sand with varying amounts of silt and gravel extending below the silt loam to borehole total depths of 36 feet.

Twelve (12) boreholes were constructed to collect samples that defined the lateral and vertical extent of degradation. The locations of these boreholes are shown on Figure 2-1. Boreholes were constructed approximately at the locations specified in the approved EOD Workplan. As requested in the IEPA approval letter dated April 11, 1994, four borings were also installed in the former tank basin in order to determine the vertical extent of degradation. Refusal was encountered at 9.5 feet in one of these borings (EOD-2) and a replacement boring (EOD-2A) was installed immediately west of the tank basin. Samples from two borings constructed as part of a Phase I RFI at the facility (RFI-1 and RFI-2 on Figure 2-1) were analyzed for the EOD parameter list.

The boreholes down-gradient (north and west) from the UST system were advanced to ground water at 36 feet below ground surface. Other boreholes were advanced at least to depths where field screening results indicated no impacts, but frequently were advanced to ground water. Refusal was encountered at a depth of 9.5 feet in borehole EOD-2, and a sample was not collected. Soil samples were collected continuously or at 2.5-foot intervals from ground surface to total borehole depth. Soil samples were not collected in the excavation fill material in the former UST basin.

### 2.1.2 Hydraulic Probe Sampling Procedures

All boreholes during the soil sampling program were installed using a hydraulic probe rig. Soil samples were collected with a one-inch diameter by two-foot long (approximate) stainless steel tube sampler (Kansas Sampler) lined with new or decontaminated brass rings. The sampler was advanced to the desired sampling depth with the hydraulic probe rods, opened by releasing the piston within the sampler, and then driven hydraulically through the sampling interval. The sampler was retrieved and



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the brass rings were removed for field screening, lithologic logging, and possible laboratory analysis.

The brass rings were separated and brass rings were retained for field screening for TOV, lithologic logging, and possible laboratory analysis. Sample collection for organic analysis was performed in brass rings sealed with Teflon sheeting in accordance with Condition 19 of IEPA's Workplan approval letter. An aliquot of sample was placed into a clean 2-ounce glass jar for possible metals analysis.

For boreholes in which field duplicate samples were collected, and for those locations where samples were split with IEPA, a second borehole was constructed, offset by less than one foot, in order to provide sufficient sample.

### 2.1.3 Field Screening Procedures

A soil sample aliquot was extruded from a brass ring into a clean Ziploc bag and the headspace vapor in each bag was monitored with a portable PID equipped with a 10.6 electron volt lamp. The TOV concentrations in the headspace were measured through a small opening in the seal. The maximum TOV measurement for each sample was recorded in parts per million (ppm) relative to a 100 ppm isobutylene standard on the borehole log (Appendix C).

### 2.1.4 Lithologic Logging

Following field screening for TOV, the soil sample aliquot in the Ziploc bag was inspected for lithology, texture, color, staining and relative moisture content. Unified Soil Classification System (USCS) designations for each soil sample were recorded on the borehole logs according to the procedures in ASTM D-2488. The borehole logs are included in Appendix C.

### 2.1.5 Laboratory Analysis

Aliquots of soil sample were retained from each sampled interval for possible laboratory analysis for the target constituents listed in Table 2-1. This list (as shown) was provided in Condition 7 of the April 11, 1994, IEPA approval letter (see Appendix A). The required detection limits correspond to the Class I-based target concentration levels contained in that letter. The target concentration levels listed in Table 2-1 were met by the laboratory.

Samples that appeared to define the degree and the extent of soil impacts based on field screening were sent to the laboratory for analysis. In those boreholes where field screening results (TOV concentrations or staining) indicated no soil quality impacts, soil samples were submitted for laboratory analysis from depths near the UST inverts (12-14 feet below ground surface) and from total borehole depths. In those boreholes where field screening results indicated impacts, soil samples were submitted for laboratory analysis from depths exhibiting the highest TOV field screening

Table 2-1. Constituent List and Target Concentration Levels, Extent of Degradation Investigation, Safety-Kleen Corp. Service Center, Pekin, Illinois.

Contaminant	Analytical Method <sup>1</sup>	Soil Concentration (mg/kg)	Ground-Water Concentration (mg/L)
<u>Inorganics</u>			
Arsenic	1311/7060	0.05*	0.05
Cadmium	1311/7131	0.005*	0.005
Chromium	1311/7191	0.1*	0.1
Lead	1311/7421	0.0075*	0.0075
<u>Organics</u>			
Acetone	8240	0.7	0.7
Bis(2-ethylhexyl)phthalate	8270	0.33	0.01
Di-n-butyl-phthalate	8270	14.0	0.7
Ethylbenzene	8240	0.7	0.7
Isophorone	8270	1.4	1.4
Methylene Chloride	8240	0.005	0.005
Mineral Spirits	Modified 8015	50.0	0.5
Xylenes	8240	10.0	10.00

\* Value is based on the analysis of the extract of the TCLP test (Method 1311 in SW-846). Thus the actual unit of measure for these values in the table above in mg/L.

<sup>1</sup> EPA SW-846 Test Methods.

concentrations and from total borehole depths. The samples were labeled, placed on ice in an opaque cooler, and submitted to the S-K Environmental Laboratory for analysis along with completed chain-of-custody/sample-analysis-request forms. The copies of the completed forms and laboratory data sheets are included in Appendix D.

#### 2.1.6 Decontamination and Borehole Abandonment

All drilling equipment was decontaminated with a detergent-water solution and rinsed in warm tap water followed by a distilled water rinse prior to constructing each borehole and before the hydraulic probe rig left the site. The hollow tube samplers were decontaminated in the same manner prior to collecting each sample. Samples collected in boreholes EOD-1 through EOD-4 were collected using new brass rings wrapped in shrink-wrap plastic. These were not decontaminated prior to use. Brass rings used for the collection of all other samples were decontaminated prior to use. All sampling wastes were containerized in 55-gallon DOT drums. Sampling wastes were handled in accordance with applicable regulations through the S-K waste management program.

Boreholes were sealed and abandoned in accordance with the procedures in the latest edition of the Illinois Water Well Construction Code (77 IAC Part 920). Boreholes were filled from total depth to ground surface with granular bentonite which was hydrated following emplacement. Paved surfaces were capped with asphalt or concrete to match the existing surface.

### 2.2 Ground-Water Monitoring Procedures

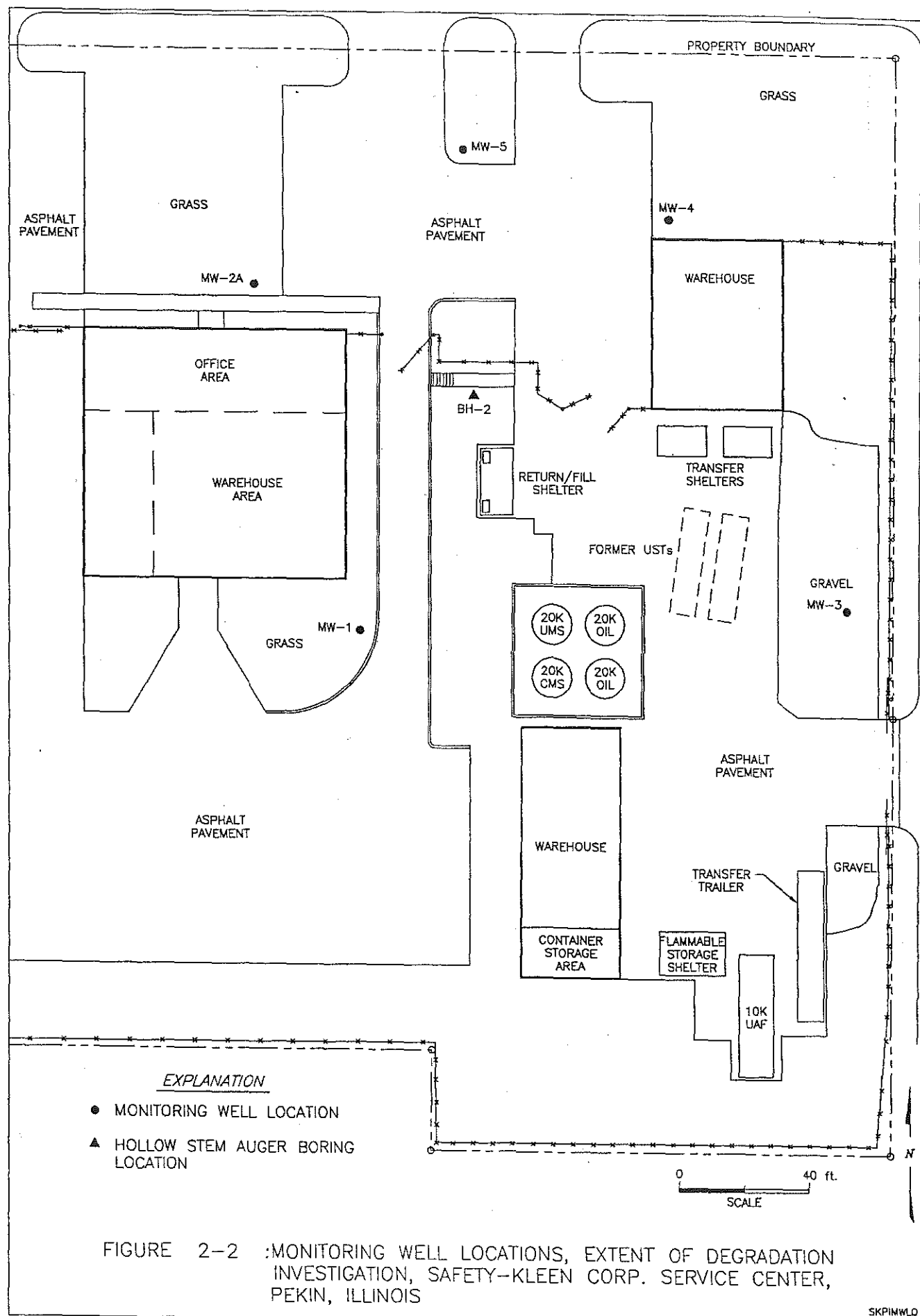
In the Workplan, S-K indicated that it would implement a ground-water quality investigation at the site if soil quality degradation was documented at the water table. The field screening results of the soil sampling program indicated elevated TOV concentrations at the water table. Therefore, S-K initiated a ground-water monitoring program consisting of the installation and sampling of one up-gradient and four down-gradient monitoring wells.

The monitoring well network was designed and installed to allow collection of representative ground-water quality data and determination of ground-water flow. As per Condition 38 of the April 11, 1994, approval letter (Appendix A), the ground-water investigation was performed in general accordance with the USEPA RCRA Technical Enforcement Guidance Document (TEGD) and the Handbook of Suggested Practice for the Design and Installation of Ground-Water Monitoring Wells.

#### 2.2.1 Monitoring Well Locations

The locations of the monitoring wells are shown on Figure 2-2. Based on local physiography, it was anticipated that ground-water flow in the vicinity of the USTs is





generally to the northwest. MW-3 was installed as an up-gradient well. A preliminary ground-water elevation survey conducted after the installation of MW-1, MW-3, and BH-2, confirmed the northwest flow direction. Wells MW-4, MW-5, and MW-2A were subsequently located down-gradient of the former UST system. During the installation of borehole BH-2, soil quality impacts were detected in the capillary fringe only, based on elevated TOV during field screening. This observation was used to infer that BH-2 was located within the lateral extent of possible ground-water quality impacts. Borehole BH-2 was abandoned and MW-2A installed further down-gradient to define the lateral extent of ground-water quality impacts.

#### 2.2.2 Monitoring Well and Installation and Completion

The monitoring wells were designed and constructed in general accordance with specifications contained in the USEPA TEGD and the Illinois Water Well Construction Code (77 IAC Part 920). The boreholes for the monitoring wells were installed using a hollow-stem auger drilling rig. Soil cuttings generated during monitoring well installation were handled in the same manner as for the cuttings from the soil sampling investigation. Borehole logs and well completion reports are included in Appendix D. Well completion details are presented in Table 2-2; all wells were completed with 10-foot screens across the water table. The wells constructed with above grade completions were completed with protective barriers. Well Construction Report forms for the five (5) wells were filed with the Illinois Department of Public Health (IDPH) and IEPA following completion. Copies of the IDPH Well Construction Reports are included in Appendix D.

#### 2.2.3 Monitoring Well Development

Well development was conducted until specific conductance values of the produced water were stable or until approximately ten (10) casing volumes of water were removed. Each well was bailed using a clean PVC bailer and dedicated polypropylene rope. Prior to use, the PVC bailer was decontaminated to prevent cross-contamination between wells. The PVC bailers were thoroughly washed with a water/detergent solution and rinsed with tap water and a final distilled water rinse after each use. Development water was handled through the S-K recycle center. Well development information is presented in Table 2-3.

#### 2.2.4 Monitoring Well Surveying/Fluid Level Measurement

All wells were surveyed by a licensed land surveyor following completion. A measuring point was established and clearly marked at the top of the north side of the well casing. The elevation of the measuring point and ground surface were determined relative to mean sea level and surveyed to an accuracy of  $\pm 0.01$  feet. Well survey information is provided in Table 2-2.

Prior to well development and sampling, the wells were monitored for water levels. Fluid levels were measured to a precision of  $\pm 0.01$  foot using an electronic

Table 2-2. Well Completion Information, Extent of Degradation Investigation, Safety-Kleen Corp. Service Center, Pekin, Illinois (August 1994).

Well	Date Completed	Total Depth (ft-bgs)	Grade Elevation (ft-msl)	Measuring Point Elevation (ft-msl)	Screened Interval (ft-bgs)	Screened Interval (ft-msl)	Depth to Water (8/94) (ft-mpe)	Water Level Elevation (8/94) (ft-msl)
MW-1	8-15-94	37.0	488.6	490.46	27.0-37.0	451.6-461.6	30.84	459.62
MW-2A	8-17-94	36.6	488.9	488.74	26.5-36.5	452.4-462.4	29.35	459.39
MW-3	8-16-94	40.3	495.3	497.30	30.2-40.2	455.1-465.1	37.52	459.78
MW-4	8-17-94	42.1	494.2	496.06	32.0-42.0	452.1-462.2	36.60	459.46
MW-5	8-18-94	37.3	489.8	489.84	27.2-37.2	452.6-462.6	30.44	459.40

ft-msl - indicates feet above mean sea level

ft-bgs - indicates feet below ground surface

ft-mpe - indicates feet below measuring point elevation

Table 2-3. Well Development Information, Extent of Degradation Investigation, Safety-Kleen Corp. Service Center, Pekin, Illinois (August 1994).

Well	Date of Development	Time of Development	Water Column in Well (ft)	Volume of Water in Well (gallons)	Water Volume Purged (gallons)	Specific Conductance ( $\mu\text{mhos/cm}$ at 25°C)	Recovery Rate	Date of Sampling	Time of Sampling	pH (std. units)
MW-1	8-19-94	0800	8.0	5.3	40 45 50	560 640 620	Nearly Instantaneous	8-19-94	1420	7.49
MW-2A	8-19-94	0930	7.0	4.6	45 50	787 775	Nearly Instantaneous	8-19-94	1415	6.90
MW-3	8-18-94	1900	4.8	3.2	45 50	561 576	Nearly Instantaneous	8-19-94	1400	7.49
MW-4	8-19-94	0700	7.4	4.9	35 40 45	464 461 464	Nearly Instantaneous	8-19-94	1430	7.00
MW-5	8-19-94	1045	7.0	4.6	50	--	Nearly Instantaneous	8-19-94	1445	6.98

well probe. Any part of the water level measuring device which contacted the water was decontaminated and rinsed with distilled water between wells.

#### 2.2.5 Sample Collection and Analysis

Following well completion and development, ground-water samples were collected for analysis. Samples collected from the monitoring wells were analyzed for the same constituent list used in the soil sampling program. The constituent list and the ground-water detection limits required by Condition 7 of the April 11, 1994 IEPA approval letter are presented in Table 2-1. In addition to the five ground-water samples, a field blank and equipment blank were submitted for analysis.

A stainless steel bailer was used to collect water samples. The rope used to lower the sampling device into each well was dedicated to that well. The bailer was decontaminated after sample collection at each well. Decontamination procedures consisted of washing the sampling device in a water/detergent solution and rinsing with tap water and a final distilled water rinse.

Water produced from the wells was not unnecessarily agitated during sampling. Sample containers for VOCs were filled such that all headspace was eliminated. For all organic analytes, water was transferred directly from the sampling device to the appropriate sample containers, without use of an intermediate transfer container. Samples to be analyzed for dissolved metals were transferred directly into a barrel filter unit and pressure filtered through a 0.45-micron filter with nitrogen gas into the appropriate sample containers.

Clean sample containers along with appropriate preservatives were provided by the laboratory. The containers and preservatives were in accordance with EPA SW-846. One set of field and equipment blanks was submitted with the samples to the laboratory for quality assurance/quality control (QA/QC). Due to an oversight, a trip blank was not shipped to the laboratory along with the samples.

The sample containers were labeled and immediately placed into opaque coolers packed with ice. The samples were shipped the day of collection, and arrived at the S-K Environmental Laboratory within 24 hours. Chain-of-custody/sample-analysis-request forms were completed and accompanied the samples to the laboratory. Copies of the Chain-of-custody/sample-analysis-request forms are included in Appendix E. Laboratory data sheets for all investigative samples and QA/QC samples are included in Appendix E.

## CHAPTER 3.0

### INVESTIGATION RESULTS

Safety-Kleen conducted the Extent of Degradation (EOD) Investigation in August 1994. Soil sampling was conducted August 9 to 12. Monitoring well installation was conducted August 15-18. Well development and sampling occurred on August 18 and 19. Laboratory analyses were conducted in August and September 1994.

S-K conducted previous soil investigations at the Pekin Service Center in July and August 1991. S-K implemented a pre-excavation soil sampling and analysis program on July 25, 1991, to characterize soil quality in the vicinity of the underground storage tank (UST) system. Following removal of the USTs and associated piping/appurtenances, soil samples were collected along the former piping runs to provide supplemental information on the nature, degree, and extent of subsurface degradation. The results of the previous assessments were presented in the "Partial Facility Closure Progress Report, Safety-Kleen Corp. Service Center, Pekin, Illinois," dated October 14, 1991. The results of these assessment activities are discussed along with the EOD investigation results in this chapter.

#### 3.1 Soil Investigation Results

Twenty-one soil samples were collected from 12 soil borings during the EOD investigation to determine the lateral and vertical extent of soil impacts. Four borings were located within the tank basin to define vertical extent as required by Condition 10 of the IEPA approval letter dated April 11, 1994. Refusal was encountered at a depth of 9.5 feet in one of these borings (EOD-2) and a replacement boring (EOD-2A) was installed immediately west of the tank basin. Eight other borings were located in the vicinity of the tank basin to define lateral extent. Eight additional samples were collected from four background locations for determination of background metals concentrations. The soil investigation results are discussed in the following sections.

##### 3.1.1 Subsurface Geology

A detailed description of regional geologic and hydrogeologic characteristics in the vicinity of the facility is presented in Chapter II of the Extent of Degradation Workplan dated September 14, 1993. The site-specific information summarized below was generated during the EOD investigation and the two previous assessments.

Soil descriptions are included on the borehole logs in Appendix C. The site is underlain by approximately two to three feet of brown silt, silt loam and clay. This soil is presumably fill material. Beneath the silt loam and clay are predominantly medium to coarse sands and gravels with varying but minor amounts of silt and minor interbeds

of finer sand. The sands and gravels extend to a depth of at least 36 feet, approximately one foot below the present water table. The basal contact of the sand and gravel was not encountered, but is expected to be about 100 feet below ground surface based on regional information.

### 3.1.2 Field Screening Results

Soil samples were field screened for Total Organic Vapors (TOV) using a photoionization detector (PID) with a 10.6 eV lamp. Field screening results are presented on Figure 3-1. Background concentrations, measured in an empty Ziploc bag, ranged as high as 7 parts per million-volume (ppmv). TOV concentrations exceed twice background from ground surface to ground water at the former spent mineral spirits tank location (EOD-3) and near the former underground piping (EOD-2A). TOV concentrations exceed twice background at shallow depths near these two areas (EOD-4 and EOD-6), but attenuate to below background well above the ground-water table. TOV concentrations exceed twice background near the ground-water table only at two locations (BH-2 and EOD-7) located down-gradient from the former spent mineral spirits tank location and associated piping; these results imply ground-water quality impacts. TOV concentrations were less than twice background at all other EOD and background soil sampling locations as well as at the five monitoring well locations.

### 3.1.3 Soil Quality

EOD analytical results are presented in Table 3-1 and on Figure 3-2. Also presented on Figure 3-2 are results from the pre-excavation sampling and pipe-run sampling conducted in 1991. Only those concentrations which exceed the soil target concentration levels for soils (as listed in Condition 7 of the April 11, 1994 IEPA letter) are shown on the figure. The following discussion summarizes all soil quality data obtained thus far from the vicinity of the former UST basin.

The laboratory analytical results are consistent with the TOV field screening data. As shown on Figure 3-2, concentrations exceed the soil target concentration reporting limits in an 0.05-acre area that encompasses much of the spent mineral spirits tank basin and the pipe runs north of the tank basin. This area is shown on Figure 3-2. As discussed in the previous section, soil impacts occur at the ground-water table at BH-2, located 50 feet northwest of the area shown on Figure 3-2. Based on field screening results, no soil impacts occur in the unsaturated zone at BH-2.

All boreholes within the area except EOD-7 have one or more samples with concentrations exceeding the soil target concentration reporting level; the 14 boreholes outside the area have no samples with concentrations exceeding the limits.

Mineral spirits concentrations exceed the IEPA target level (50 mg/kg) at eight locations in the area shown on Figure 3-2. However, mineral spirits concentrations exceeding 50 mg/kg extend to ground water at only three locations (EOD-2A, EOD-3, EOD-6) in the southern part of this area. Soil impacts due to mineral spirits are





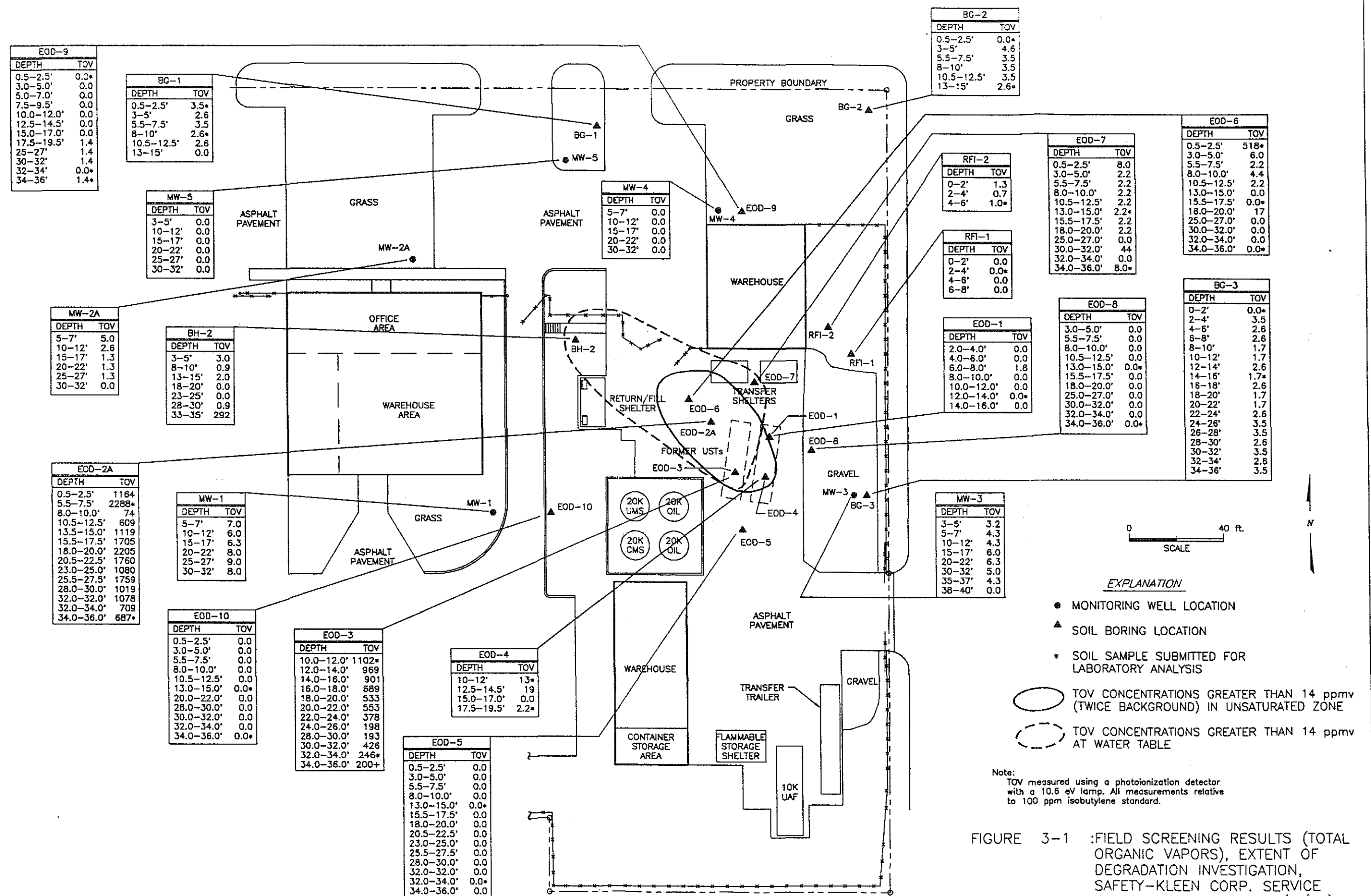




Table 3-1. Soil Quality Data, Extent of Degradation Investigation, Safety-Kleen Service Center, Pekin, Illinois.

Sample	VOCs (mg/kg)				SVOCs (mg/kg)			TPH (mg/kg)	TCLP Metals (mg/L)			
	Acetone	Ethyl benzene	Methylene Chloride	Xylenes	Bis(2-ethylhexyl) phthalate	Di-n-butyl phthalate	Isophorone	Mineral Spirits	Arsenic	Cadmium	Chromium	Lead
EOD-1 (12-14)	ND(0.7)	ND(0.7)	ND(0.005)	ND(10)	ND(0.33)	ND(14.0)	ND(1.4)	ND(50)	ND(0.05)	ND(0.005)	ND(0.10)	ND(0.0075)
EOD-2A (5.5-7.5)	ND(0.7)	ND(0.7)	ND(0.005)	ND(10)	ND(0.33)	ND(14.0)	ND(1.4)	638	ND(0.05)	ND(0.005)	ND(0.10)	ND(0.0075)
EOD-2A (34-36)	ND(0.7)	ND(0.7)	ND(0.005)	ND(10)	ND(0.33)	ND(14.0)	ND(1.4)	1224	ND(0.05)	ND(0.005)	ND(0.10)	ND(0.0075)
EOD-3 (10-12)	ND(0.7)	ND(0.7)	ND(0.005)	ND(10)	ND(0.33)	ND(14.0)	ND(1.4)	1345	ND(0.05)	0.007	ND(0.10)	0.016
EOD-3 (32-34)	ND(0.7)	ND(0.7)	ND(0.005)	ND(10)	ND(0.33)	ND(14.0)	ND(1.4)	423	ND(0.05)	ND(0.005)	ND(0.10)	ND(0.0075)
EOD-4 (10-12)	ND(0.7)	ND(0.7)	ND(0.005)	ND(10)	ND(0.33)	ND(14.0)	ND(1.4)	ND(50)	ND(0.05)	ND(0.005)	ND(0.10)	ND(0.0075)
EOD-4 (17.5-19.5)	ND(0.7)	ND(0.7)	ND(0.005)	ND(10)	ND(0.33)	ND(14.0)	ND(1.4)	ND(50)	ND(0.05)	0.0084	ND(0.10)	ND(0.0075)
EOD-5 (13-15)	ND(0.7)	ND(0.7)	ND(0.005)	ND(10)	ND(0.33)	ND(14.0)	ND(1.4)	ND(50)	ND(0.05)	ND(0.005)	ND(0.10)	ND(0.0075)
EOD-5 (32-34)	ND(0.7)	ND(0.7)	ND(0.005)	ND(10)	ND(0.33)	ND(14.0)	ND(1.4)	ND(50)	ND(0.05)	ND(0.005)	ND(0.10)	ND(0.0075)
EOD-6 (0.5-2.5)	ND(0.7)	ND(0.7)	ND(0.005)	ND(10)	ND(0.33)	ND(14.0)	ND(1.4)	4492	ND(0.05)	ND(0.005)	ND(0.10)	ND(0.0075)
EOD-6 (15.5-17.5)	ND(0.7)	ND(0.7)	ND(0.005)	ND(10)	ND(0.33)	ND(14.0)	ND(1.4)	149	ND(0.05)	ND(0.005)	ND(0.10)	ND(0.0075)
EOD-6 (34-36)	ND(0.7)	ND(0.7)	ND(0.005)	ND(10)	ND(0.33)	ND(14.0)	ND(1.4)	61	ND(0.05)	ND(0.005)	ND(0.10)	ND(0.0075)
EOD-7 (13-15)	ND(0.7)	ND(0.7)	ND(0.005)	ND(10)	ND(0.33)	ND(14.0)	ND(1.4)	ND(50)	ND(0.05)	ND(0.005)	ND(0.10)	ND(0.0075)
EOD-7 (34-36)	ND(0.7)	ND(0.7)	ND(0.005)	ND(10)	ND(0.33)	ND(14.0)	ND(1.4)	ND(50)	ND(0.05)	ND(0.005)	ND(0.10)	ND(0.0075)
EOD-8 (13-15)	ND(0.7)	ND(0.7)	ND(0.005)	ND(10)	ND(0.33)	ND(14.0)	ND(1.4)	ND(50)	ND(0.05)	ND(0.005)	ND(0.10)	ND(0.0075)
EOD-8(34-36)	ND(0.7)	ND(0.7)	ND(0.005)	ND(10)	ND(0.33)	ND(14.0)	ND(1.4)	ND(50)	ND(0.05)	ND(0.005)	ND(0.10)	ND(0.0075)
EOD-9 (34-36)	ND(0.7)	ND(0.7)	ND(0.005)	ND(10)	ND(0.33)	ND(14.0)	ND(1.4)	ND(50)	ND(0.05)	ND(0.005)	ND(0.10)	ND(0.0075)
EOD-10 (13-15)	ND(0.7)	ND(0.7)	ND(0.005)	ND(10)	ND(0.33)	ND(14.0)	ND(1.4)	ND(50)	ND(0.05)	ND(0.005)	ND(0.10)	ND(0.0075)
EOD-10 (34-36)	ND(0.7)	ND(0.7)	ND(0.005)	ND(10)	ND(0.33)	ND(14.0)	ND(1.4)	ND(50)	ND(0.05)	ND(0.005)	ND(0.10)	ND(0.0075)
RFI-1 (4-6)	ND(0.7)	ND(0.7)	ND(0.005)	ND(10)	ND(0.33)	ND(14.0)	ND(1.4)	ND(50)	ND(0.05)	ND(0.005)	ND(0.10)	ND(0.0075)
RFI-2 (2-4)	ND(0.7)	ND(0.7)	ND(0.005)	ND(10)	ND(0.33)	ND(14.0)	ND(1.4)	ND(50)	ND(0.05)	ND(0.005)	ND(0.10)	ND(0.0075)
Background Samples												
Silt/Loam												
BG-1 (0.5-2.5)	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.05)	ND(0.05)	ND(0.10)	ND(0.0075)
BG-2 (0.5-2.5)	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.05)	ND(0.05)	ND(0.10)	ND(0.0075)
BG-3 (0.5-2.5)	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.05)	ND(0.05)	ND(0.10)	ND(0.0075)
EOD-9 (0.5-2.5)	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.05)	ND(0.05)	ND(0.10)	ND(0.0075)
Sand												
BG-1 (8-10)	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.05)	ND(0.05)	ND(0.10)	ND(0.0075)
BG-2 (13-15)	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.05)	ND(0.05)	ND(0.10)	ND(0.0075)
BG-3 (14-16)	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.05)	ND(0.05)	ND(0.10)	ND(0.0075)
EOD-9 (32-34)	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.05)	ND(0.05)	ND(0.10)	ND(0.0075)

NA = Not Analyzed

ND = Not Detected (Detection Limit in Parentheses)



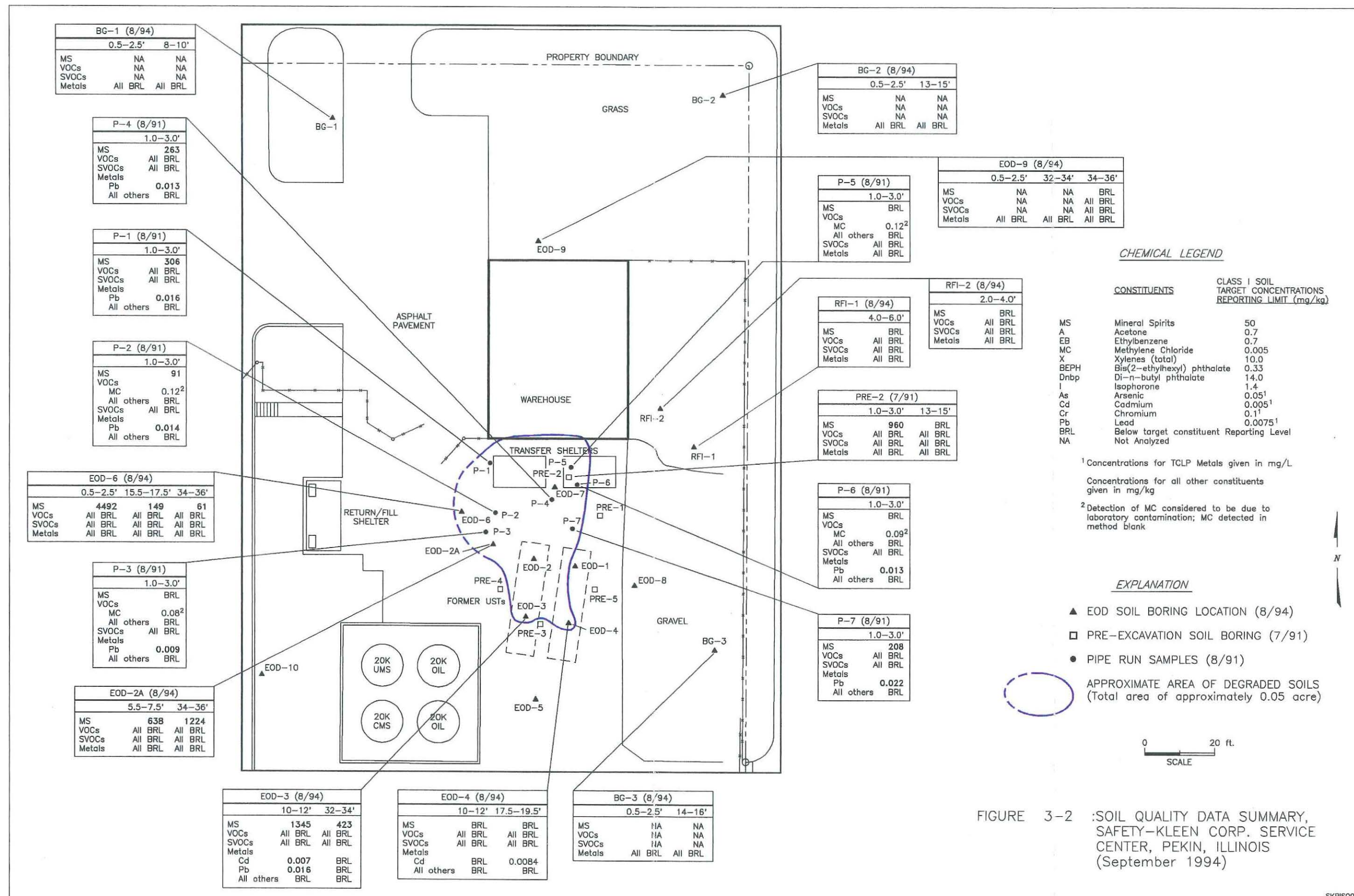


FIGURE 3-2 :SOIL QUALITY DATA SUMMARY, SAFETY-KLEEN CORP. SERVICE CENTER, PEKIN, ILLINOIS (September 1994)



confined to the shallow silt basin fill (up to 3 feet below ground surface, in the northern part of this area (Figure 3-2).

All volatile and semi-volatile organic compound concentrations are below the soil target concentration reporting limits except for methylene chloride, which was measured at low concentrations (up to 0.12 mg/kg) at three locations along the pipe runs. Methylene chloride is a common laboratory solvent, and may have been introduced in the laboratory.

Of the target metals, lead was measured at low concentrations (up to 0.022 mg/L, reporting limit is 0.0075 mg/L) at seven locations dispersed through the 0.05-acre area shown on Figure 3-2, and cadmium was measured at low concentrations (up to 0.008 mg/L, reporting limit is 0.005 mg/L) along the southern edge of the area. All other metals concentrations are below the soil target concentration reporting limits, including those measured at the background locations.

### 3.2 Ground-Water Investigation Results

Mineral spirits at concentrations greater than the soil target concentration reporting limit is present at the water table in the vicinity of the UST systems. Upon receipt of the laboratory data, IEPA was notified in writing per Condition 33 of the April 11, 1994 letter. The S-K notification letter is dated September 23, 1994, and is included in Appendix A.

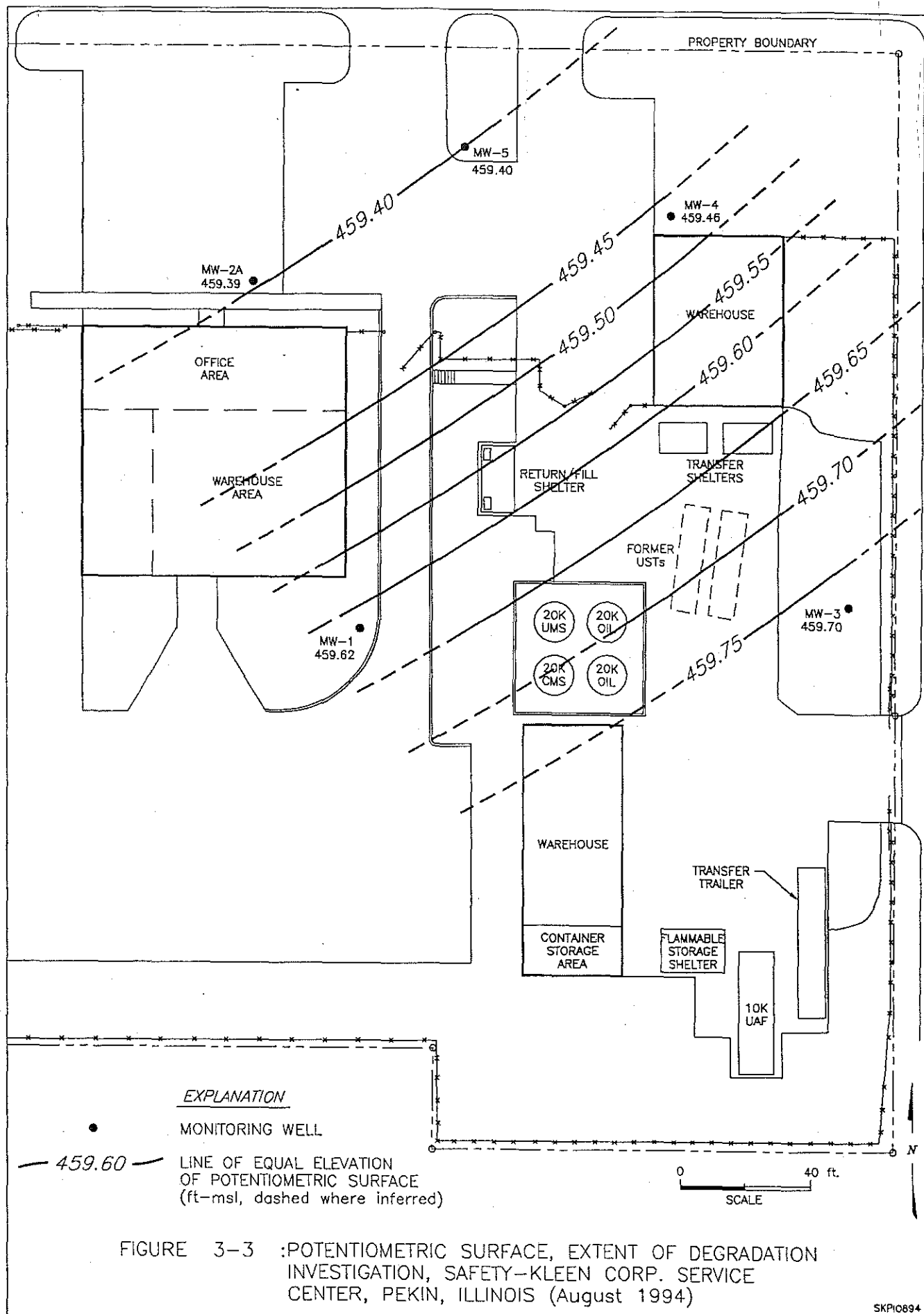
Due to the detection of soil impacts at the water table, S-K conducted a ground-water investigation as part of the EOD field activities. Five monitoring wells were installed, developed, and sampled for the target constituents listed in Condition 7 of the April 11, 1994, letter. Well completion information and borehole logs are presented in Appendix C.

#### 3.2.1 Ground-Water Potentiometric Surface

Well completion information and fluid level measurements are presented in Table 2-2. The ground-water potentiometric surface is shown on Figure 3-3. Ground-water flow under the site is to the northwest toward the Illinois River at a relatively flat gradient of 0.002 ft/ft. This result is consistent with the regional potentiometric surface (Walker et al., 1965; Varljen and Shafer, 1993). A detailed discussion of regional hydrogeology is presented in Chapter II of the EOD Workplan dated September 14, 1993.

#### 3.2.3 Water Quality

The one up-gradient well (MW-3) and four down-gradient wells were sampled for the constituents listed in Table 2-1. A field and equipment blank were also





analyzed. The analytical results are presented in Table 3-2, and on Figure 3-4. Also shown on Figure 3-4 are the locations where TOV field screening concentrations and mineral spirits concentrations in soils were elevated at the ground-water table. None of the target constituents was detected in any of the ground-water investigative samples or blanks.

Table 3-2. Water Quality Data, Extent of Degradation Investigation, Safety-Kleen Service Center, Pekin, Illinois.<sup>1</sup>

Monitoring Well	VOCs				SVOCs			TPH	Metals			
	Acetone	Ethylbenzene	Methylene Chloride	Xylenes	Bis(2-ethylhexyl)-phthalate	Di-n-butyl phthalate	Isophorone	Mineral Spirits	Arsenic	Cadmium	Chromium	Lead
<u>Investigative Samples</u>												
MW-1	ND(0.7)	ND(0.7)	ND(0.005)	ND(10)	ND(0.01)	ND(0.7)	ND(1.4)	ND(0.5)	ND(0.005)	ND(0.005)	ND(0.1)	ND(0.0075)
MW-2A	ND(0.7)	ND(0.7)	ND(0.005)	ND(10)	ND(0.01)	ND(0.7)	ND(1.4)	ND(0.5)	ND(0.005)	ND(0.005)	ND(0.1)	ND(0.0075)
MW-3	ND(0.7)	ND(0.7)	ND(0.005)	ND(10)	ND(0.01)	ND(0.7)	ND(1.4)	ND(0.5)	ND(0.005)	ND(0.005)	ND(0.1)	ND(0.0075)
MW-4	ND(0.7)	ND(0.7)	ND(0.005)	ND(10)	ND(0.01)	ND(0.7)	ND(1.4)	ND(0.5)	ND(0.005)	ND(0.005)	ND(0.1)	ND(0.0075)
MW-5	ND(0.7)	ND(0.7)	ND(0.005)	ND(10)	ND(0.01)	ND(0.7)	ND(1.4)	ND(0.5)	ND(0.005)	ND(0.005)	ND(0.1)	ND(0.0075)
<u>Quality Control Samples</u>												
EB 819	ND(0.7)	ND(0.7)	ND(0.005)	ND(10)	ND(0.01)	ND(0.7)	ND(1.4)	ND(0.5)	ND(0.005)	ND(0.005)	ND(0.1)	ND(0.0075)
FB 819	ND(0.7)	ND(0.7)	ND(0.005)	ND(10)	ND(0.01)	ND(0.7)	ND(1.4)	ND(0.5)	ND(0.005)	ND(0.005)	ND(0.1)	ND(0.0075)

<sup>1</sup> All concentrations in mg/L.



## CHAPTER 4.0

### PROPOSED REMEDIAL ACTION PROGRAM

The results of the closure activities completed to date indicate that subsurface degradation exists in the vicinity of the former USTs. Safety-Kleen Corp. (S-K) intends to remediate soil and ground-water impacts at the site to meet the closure performance standards and achieve clean closure. As discussed in Chapter 3, the nature and extent of soil degradation is adequately defined for the purpose of designing the remedial action program. The proposed soil remediation program is described in Section 4.1.

Additional assessment data is required to determine the need for a ground-water remediation program. The proposed additional assessment and possible remedial action program for ground water are described in sections 4.2 and 4.3 respectively. The schedule for implementation of the proposed remedial action program depends on obtaining IEPA approval for this proposed remedial action program and any required permits from IEPA or other agencies.

#### 4.1 Soil Remediation Program

S-K identified soil quality degradation associated with the spent mineral spirits tank and piping system at its Pekin Service Center. The results of the soil investigations are:

1. Soil concentrations in the unsaturated zone exceed the soil target concentration levels in a small (0.05-acre) area in the vicinity of the former tank and piping system (see Figure 3-2).
2. Soil concentrations exceeding the target concentration levels extend from shallow depths to ground water (35 feet below ground surface) in the southern part of the 0.05-acre area (south of EOD-6).
3. Soil concentrations are elevated at the water table at one location 50 feet down-gradient of the 0.05-acre area.
4. Soil concentrations exceeding the target concentration levels occur only in the silt loam fill (up to three feet below ground surface) in the northern part of the 0.05-acre area.
5. Mineral spirits concentrations exceeding the target level (50 mg/kg) occur throughout the 0.05-acre area. Methylene chloride concentrations slightly exceed the target level (0.005 mg/kg) in the shallow soils along two pipe runs. TCLP lead concentrations slightly exceed the target level (0.0075 mg/L) at seven locations in the 0.05 acre area. TCLP cadmium

concentrations slightly exceed the level (0.005 mg/L) at two locations along the southern boundary of the area.

6. Subsurface lithology within the zone of degradation is composed primarily of coarse sand and gravel with a thin covering (uppermost three feet) of silt loam fill.

#### 4.1.1 Proposed Soil Remediation Option: Soil Vapor Extraction

Based on existing site conditions, S-K plans to use soil vapor extraction (SVE) to remediate the soils degraded by releases from the former UST system. The goal of SVE is to remediate degraded soils to the extent necessary to achieve clean closure. S-K has selected SVE technology at the Pekin Service Center for the following reasons:

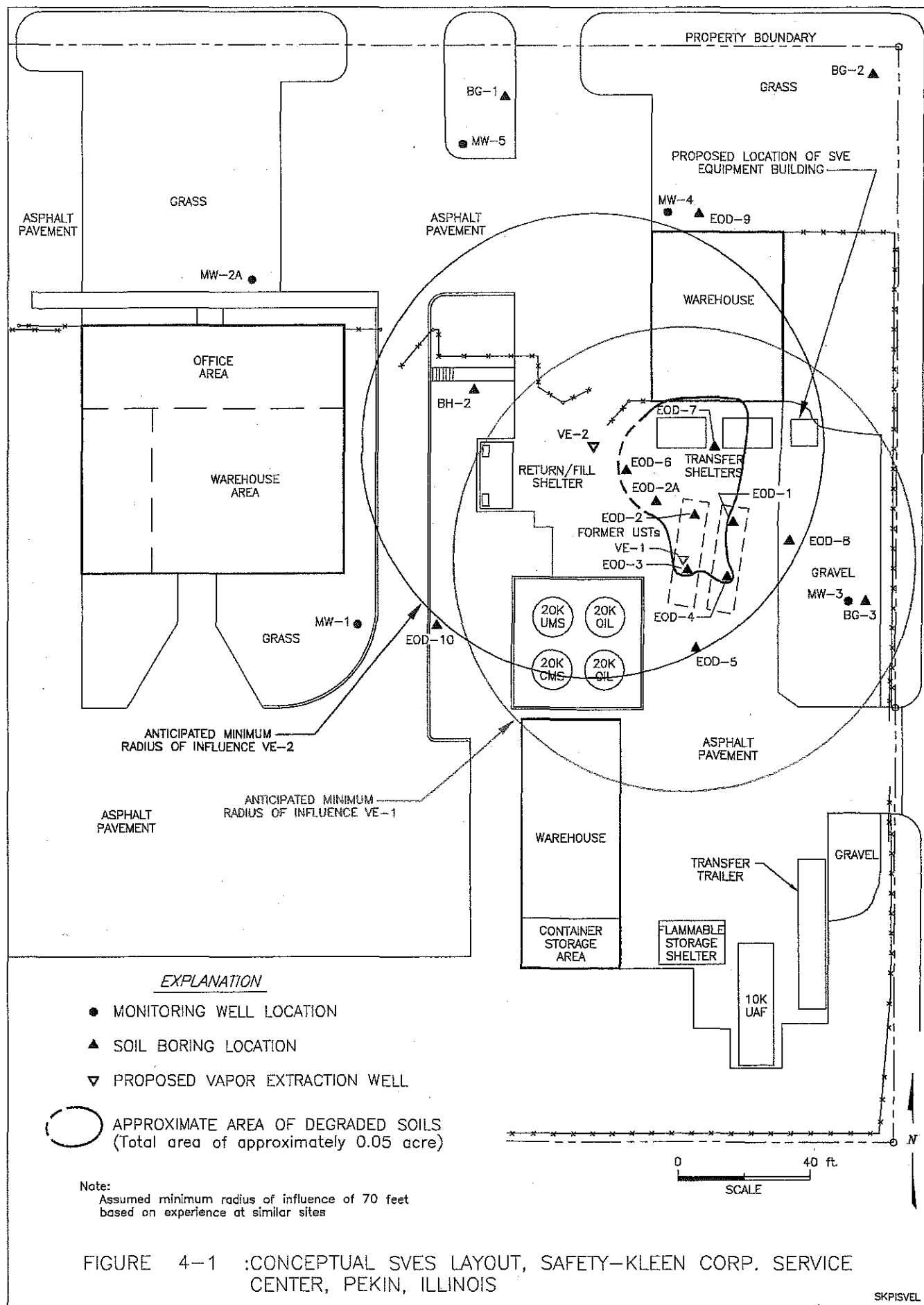
1. The volatile hydrocarbons that comprise mineral spirits are conducive to in-situ remediation by SVE;
2. Ventilation of the degraded soils will increase oxygen concentrations in the subsurface and enhance natural bioremediation;
3. The primary subsurface lithology (coarse sand and gravel) is conducive to remediation by SVE;
4. Safety-Kleen has successfully employed SVE at other sites with soil degradation due to mineral spirits; and
5. The location of the zone of degradation in an area of current facility operations and the vertical extent of soil degradation, make excavation and disposal impractical.

SVE is based on the principle that volatile hydrocarbons such as mineral spirits that are adsorbed on soil particles will volatilize at typical subsurface temperatures. A zone of low pressure is created at a vapor extraction well which induces subsurface air flow through the surrounding soils. This ventilation of the degraded soil enhances the natural volatilization of the volatile hydrocarbons by modifying the vapor-phase equilibrium in the pore spaces. Research has also shown that increased oxygen concentrations in the venting zone will enhance the natural biodegradation of organic compounds in the subsurface.

#### 4.1.2 SVES Design

The SVE system (SVES) will address remediation of the entire zone of degradation due to the former USTs. A conceptual layout of the system is shown on figures 4-1 through 4-3. The system will include the following primary components:

1. Vapor extraction Well VE-1 screened from approximately 15 to 36 ft-bgs;



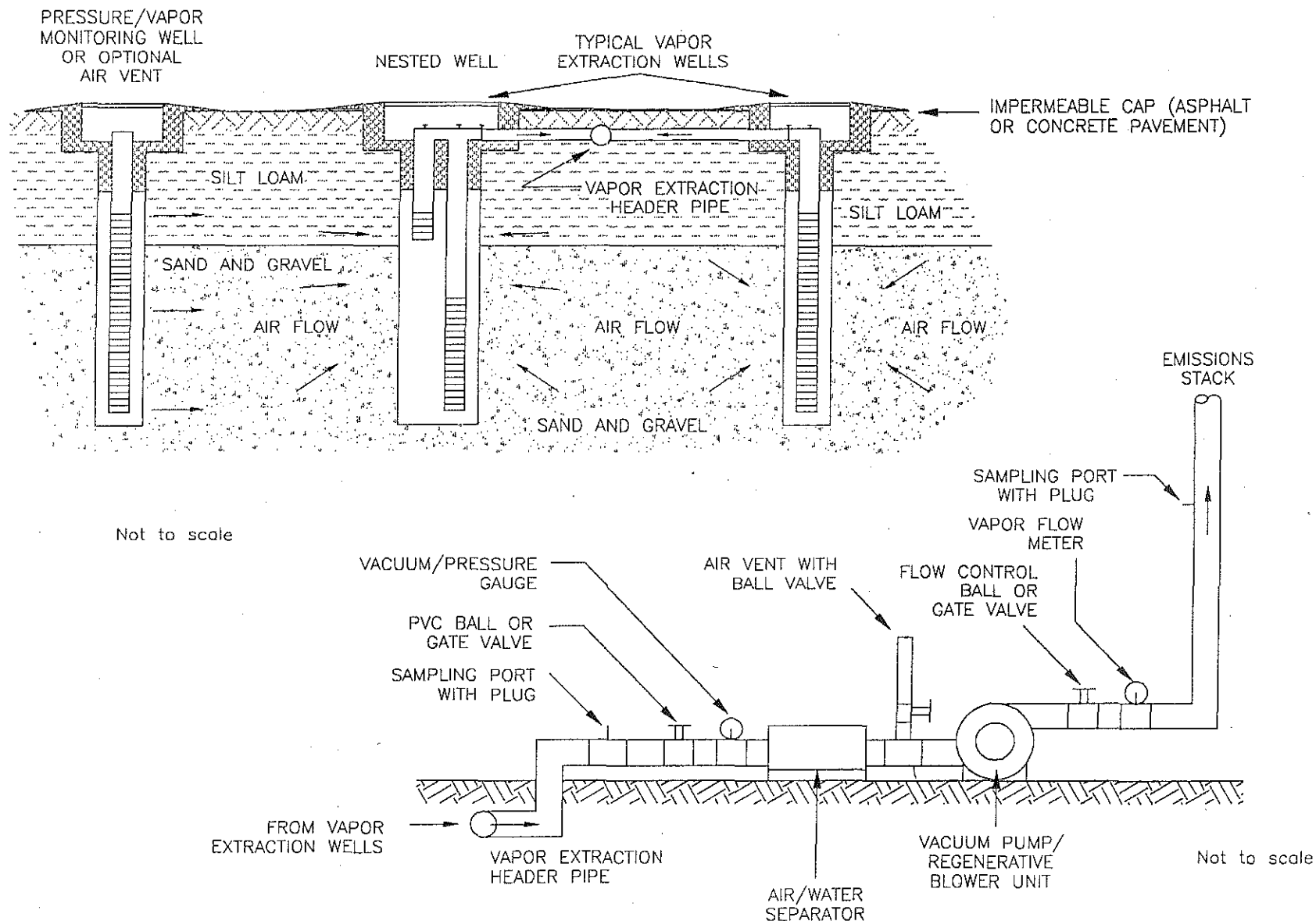


FIGURE 4-2 :SOIL VAPOR EXTRACTION SYSTEM CONCEPTUAL DESIGN, SAFETY-KLEEN CORP., SERVICE CENTER, PEKIN, ILLINOIS

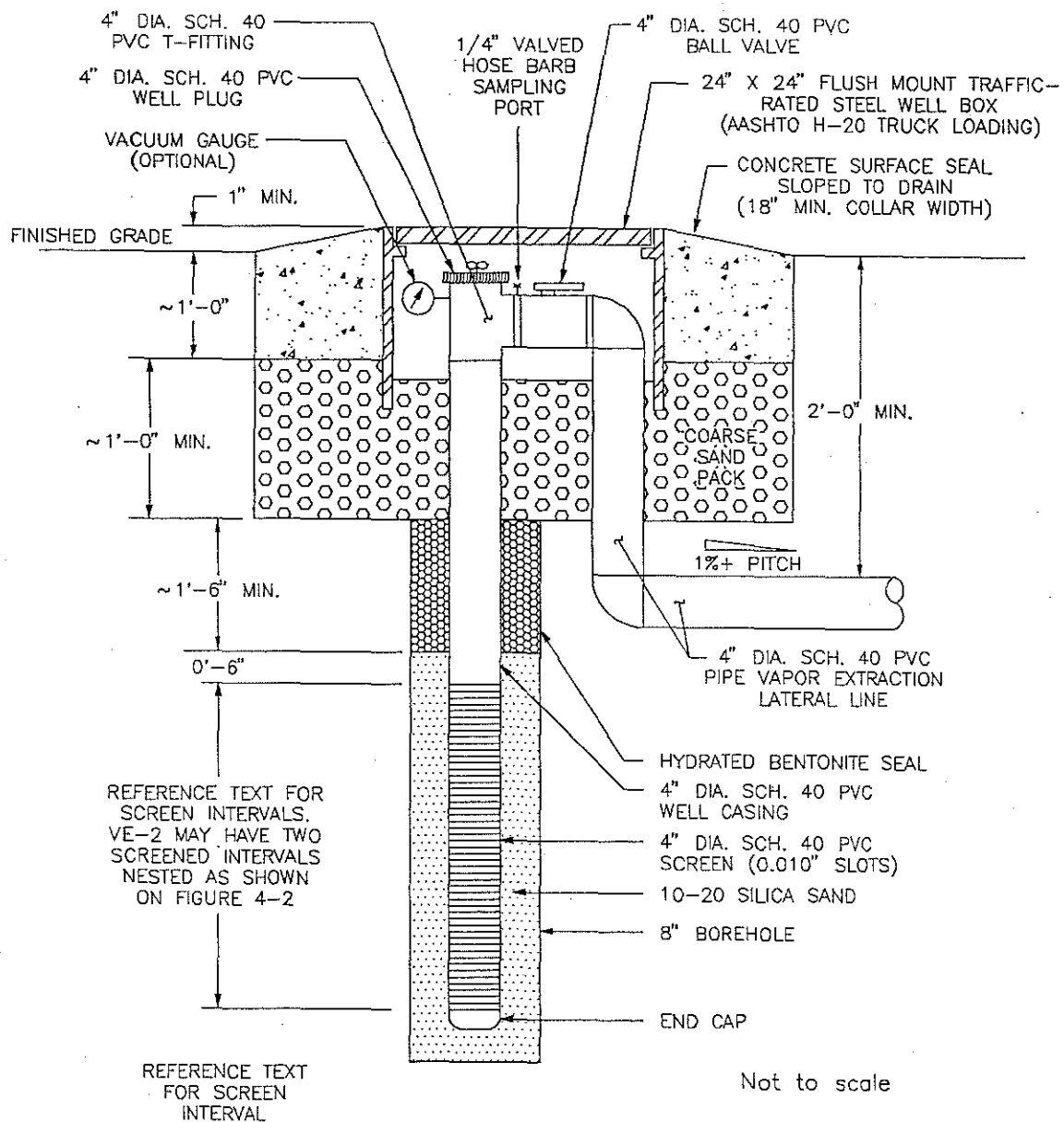


FIGURE 4-3 :TYPICAL SOIL VAPOR EXTRACTION WELL COMPLETION DIAGRAM, SAFETY-KLEEN CORP. SERVICE CENTER, PEKIN, ILLINOIS



2. Nested vapor extraction wells VE-2L screened from approximately 10 to 36 ft-bgs and VE-2U screened from approximately 1 to 3 ft-bgs;
3. Underground header piping to connect the extraction wells;
4. A single modular vacuum pump/regenerative blower unit connected to all extraction wells and enclosed in an equipment building;
5. An air/water separator (i.e., knockout pot);
6. An emissions stack to vent extracted vapors to the atmosphere;
7. Miscellaneous piping, valves, gauges, and appurtenances to control and monitor the operation of the SVES; and
8. An impermeable cap of concrete and asphalt pavement (already in place) over the area to be influenced by the SVES.

The vapor extraction wells are screened to target the intervals of soil degradation. Proposed locations of the vapor extraction wells and estimated radii of influence are shown on Figure 4-1. The predicted radii of influence (70 feet) are based on a conservative estimate of the radii observed at other sites. S-K has taken a second conservative approach in designing the SVES, such that there is greater than a 50% overlap in the radii of influence between the extraction wells.

#### 4.1.3 SVES Start-up Tests

Due to the conservative design selected for the SVES and the limited extent of soil degradation, S-K does not plan to conduct pilot testing prior to construction of the full-scale system. However, start-up tests will be conducted to achieve the following objectives:

1. To estimate the soil permeability;
2. To determine the radius of influence at various flow rates and applied wellhead vacuums; and
3. To estimate VOC removal rates.

Existing monitoring wells constructed as part of the EOD investigation and additional ground-water assessment (Section 4.2) will be used as vapor monitoring points during start-up tests. The start-up test procedures may include:

1. Measuring induced vacuums at monitoring points for various flow rates and applied wellhead vacuums.
2. Measuring total organic vapors at the monitoring points and in the emissions.

3. Collecting vapor samples from the emissions to be submitted for laboratory analysis of mineral spirits. Estimated removal rates for mineral spirits will be compared to state air quality standards. If necessary to comply with applicable standards, a vapor treatment unit will be incorporated into the system.

During initial operation, total organic vapor concentrations in the extracted air will be continually measured with a photoionization detector (PID). Induced wellhead vacuums at the existing ground-water monitoring wells will be monitored at least twice during initial start-up. When conditions stabilize, samples of extracted vapors may be collected for laboratory analysis of mineral spirits. S-K plans to collect the samples in Tedlar bags or equivalent container from a port on the emissions stack. Analyses shall be conducted by a qualified laboratory.

#### 4.1.4 SVES Operation and Monitoring

S-K intends to operate the SVES under a permit from IEPA/Division of Air Pollution Control (DAPC). VOC concentrations in the emissions are expected to stabilize at levels acceptable for direct venting to the atmosphere given the limited degree and extent of soil impacts. However, this assumption will be verified with vapor sampling during start-up of the system.

S-K will commence SVES operation following approval of the State air emissions permit. The proposed start-up monitoring schedule is presented in Table 4-1. The SVES is intended to operate continuously from start-up until remediation is complete.

S-K intends to monitor the SVES quarterly during its operation to ensure proper operation, compliance with the IEPA/DAPC operating permit, and progress toward remediation. S-K has proposed the monitoring schedule shown in Table 4-1. This monitoring schedule may be modified depending on the site-specific operating and performance characteristics.

Experience at other sites has shown that extracted vapor concentrations decline rapidly during the first few weeks of operation. The quarterly monitoring data will be continuously evaluated to determine the SVES performance, and when the in situ remediation is near completion. During the last month(s) of operation, S-K may intermittently operate the SVES to evaluate progress toward clean closure.

Routine maintenance and performance monitoring may result in shutting down the SVES for one to seven days each quarter during the life to the operation. S-K will notify IEPA of any operational problems with the proposed SVES which result in shutdown for more than 10 days. IEPA will also be notified when S-K determines that intermittent operation is appropriate to evaluate remedial progress and when S-K plans to collect closure verification samples.

Table 4-1. Full-Scale SVES Monitoring Schedule, Safety-Kleen Corp. Service Center, Pekin, Illinois.

Start Up

Day 1:

1. Monitor operating parameters (e.g., flowrate, applied wellhead vacuum, inlet and outlet temperature).
2. Frequently monitor TOV concentrations in the SVES emissions with a PID.
3. Frequently monitor TOV concentrations and induced vacuums at the monitoring points.
4. Collect two vapor samples from the emissions to be analyzed for mineral spirits.

Day 2:

1. Monitor operating parameters.
2. Frequently monitor TOV concentrations in the SVES emissions with a PID.
3. Frequently monitor TOV concentrations and induced vacuums at the monitoring points.
4. Collect one vapor sample from the emissions to be analyzed for mineral spirits.

End of Week 1:

1. Monitor operating parameters.
2. Monitor TOV concentrations in the SVES in emissions with PID.
3. Monitor TOV concentrations and induced vacuums at the monitoring points.
4. Collect one vapor sample from emissions to be analyzed for mineral spirits.

End of Month 1: Same as End of Week 1.

Quarterly for System Life:

1. Monitor operating parameters (flowrate, applied wellhead vacuum, inlet and outlet temperatures).
2. Monitor TOV concentrations in the SVES emissions with PID.
3. Monitor TOV concentrations and induced vacuums at the monitoring points.
4. Collect one vapor sample from emissions to be analyzed for mineral spirits.
5. Perform routine inspection and maintenance of the system.

## 4.2 Additional Ground-Water Assessment

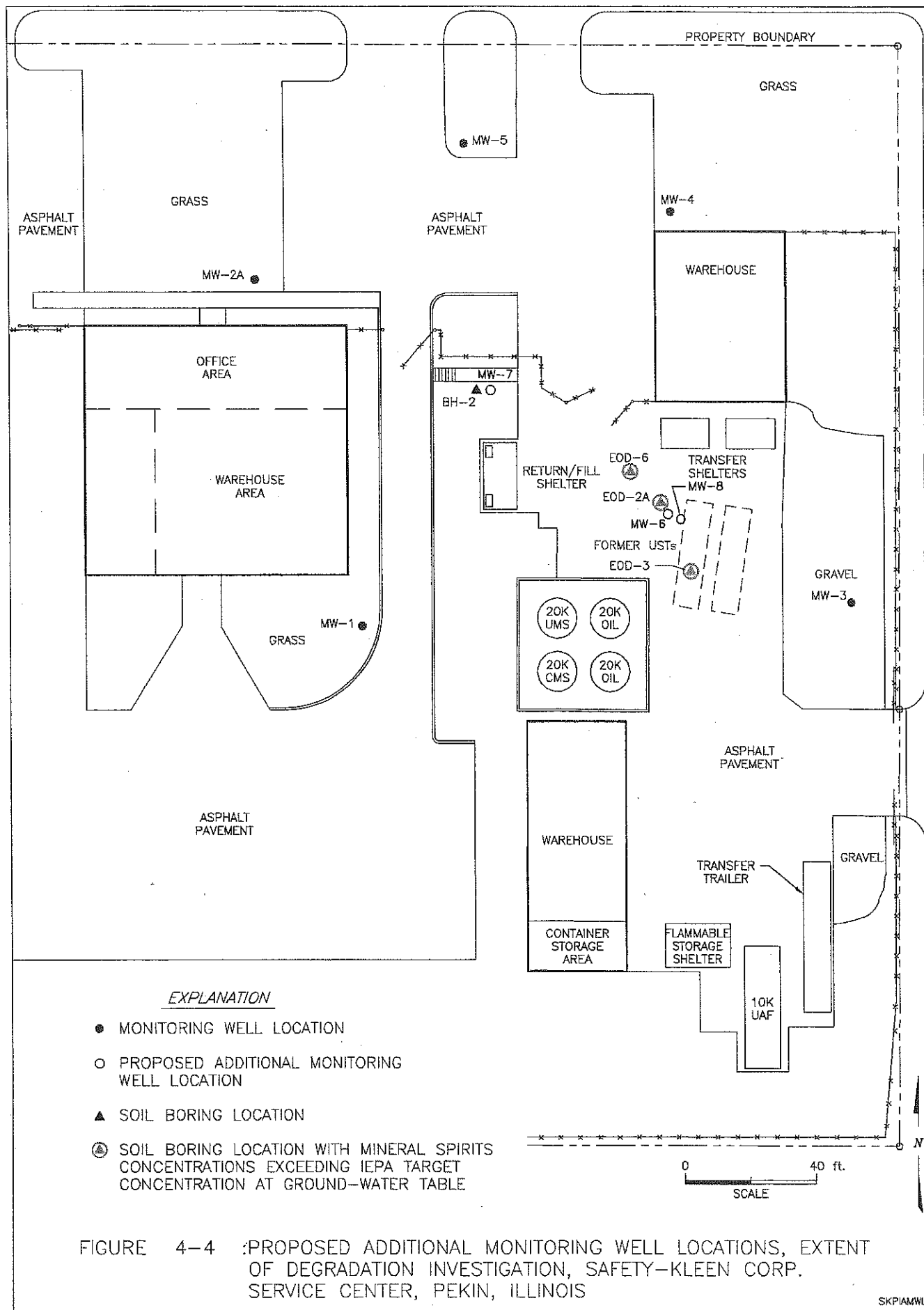
Mineral spirits concentrations over the reporting limit have been documented at the water table at three locations in the vicinity of the former USTs. No ground-water monitoring wells are located in this area. S-K proposes to install and sample a monitoring well (MW-6) immediately down-gradient of the former tank basin to determine the degree of ground-water quality degradation. As shown on Figure 4-4, this well will be located near boring EOD-2A where the highest concentration of mineral spirits was detected in the soils at the ground-water table. This well will be screened across the water table.

Immediately after installation, S-K will develop and sample the well according to the procedures described in Chapter 2.0. Samples will be sent to the S-K Environmental Laboratory for analysis of those constituents measured in soil samples at concentrations above the target concentration levels (mineral spirits, methylene chloride, cadmium, and lead). If concentrations are below the target concentration levels for ground water, S-K will consider the ground water part of closure complete. The target concentration levels are given in Condition 7 of the IEPA letter dated April 11, 1994, and are:

Target Constituent	Ground-Water Target Concentration (mg/L)
Mineral Spirits	0.5
Methylene Chloride	0.005
Cadmium	0.005
Lead	0.0075

If concentrations are above the target concentration levels for ground water, S-K will continue assessment activities to define the extent of impacts. Well MW-7 (Figure 4-4) will be installed near boring BH-2, where TOV field screening results indicate possible soil impacts at the ground-water table, to define the lateral extent of impacts more precisely. Immediately adjacent to MW-6, S-K proposes to install Well MW-8 screened 20 feet below the water table, for determination of the vertical extent of ground-water degradation.

Wells MW-7 and MW-8 will be monitored for those constituents measured at concentrations above the target concentration levels in Well MW-6. The new monitoring wells will be installed using the procedures described in Chapter 2.0 of this report. Installation procedures will comply with the requirements stated in the relevant conditions of the April 11, 1994, IEPA letter. The only possible modification is that Well MW-8 may be installed with a PVC screen approximately 2 feet in length and a 2-inch diameter casing so that it could be used as an air sparge point, if appropriate.



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#### 4.3 Ground-Water Remediation Program

If ground-water concentrations exceed the target concentration levels, S-K will follow one or more courses of action:

1. Conduct additional ground-water assessment and/or monitoring;
2. Perform a risk-based health assessment; and/or
3. Commence ground-water quality remediation by air sparging.

S-K may use air sparging for remediation of degraded ground water (if any) to expedite the following reasons:

1. The volatile hydrocarbons that comprise mineral spirits are conducive to in-situ remediation by air-sparging;
2. The primary subsurface lithology (coarse sand and gravel) is conducive to remediation by air-sparging;
3. Safety-Kleen has successfully employed air-sparging at other sites with soil degradation due to mineral spirits; and
4. Ground-water remediation by air-sparging will be enhanced by the SVE system proposed for soil remediation at the site.

Ground-water air sparging utilizes an air compressor to inject air below the ground-water table. As the air travels through the hydrocarbon-impacted ground water, the airflow induces volatilization which removes the hydrocarbon contaminant from the water, and transports it to the unsaturated zone. The hydrocarbon is then removed from the unsaturated zone by the vapor extraction system.

A final decision on the need for and design of an air sparging system will be based on the results of the additional ground-water assessment. S-K will provide the assessment results and a proposed air sparging design (if appropriate) in a Closure Progress Report within 90 days of receipt of the analytical data.

#### 4.4 Demonstrating Completion of Remediation

Subsurface degradation will be remedied to the extent practicable to satisfy the IEPA target concentration levels or risk-based clean-up objectives agreed upon by S-K and IEPA. Based on previous experience with soil vapor extraction, S-K believes significant progress toward remediation will occur during the first few months of operation. However, six months to two years may be necessary to complete soil and ground-water remediation to the extent practicable with SVES and air sparging sys-

tems (if necessary). Therefore, the closure period may need to be extended to achieve clean closure.

#### 4.4.1 Verification Soil Sampling and Analysis

When remediation appears to be nearing completion, based on mineral spirits concentrations in the emissions, S-K will conduct performance testing of the SVES. Performance testing will include shutdown for at least one week to allow residual mineral spirits constituents in the soil, if any, to reach approximate equilibrium. The system will be restarted and a vapor sample will be collected to evaluate residual soil degradation. Based on the results of this performance testing, S-K will coordinate with IEPA to demonstrate successful completion of soil remediation.

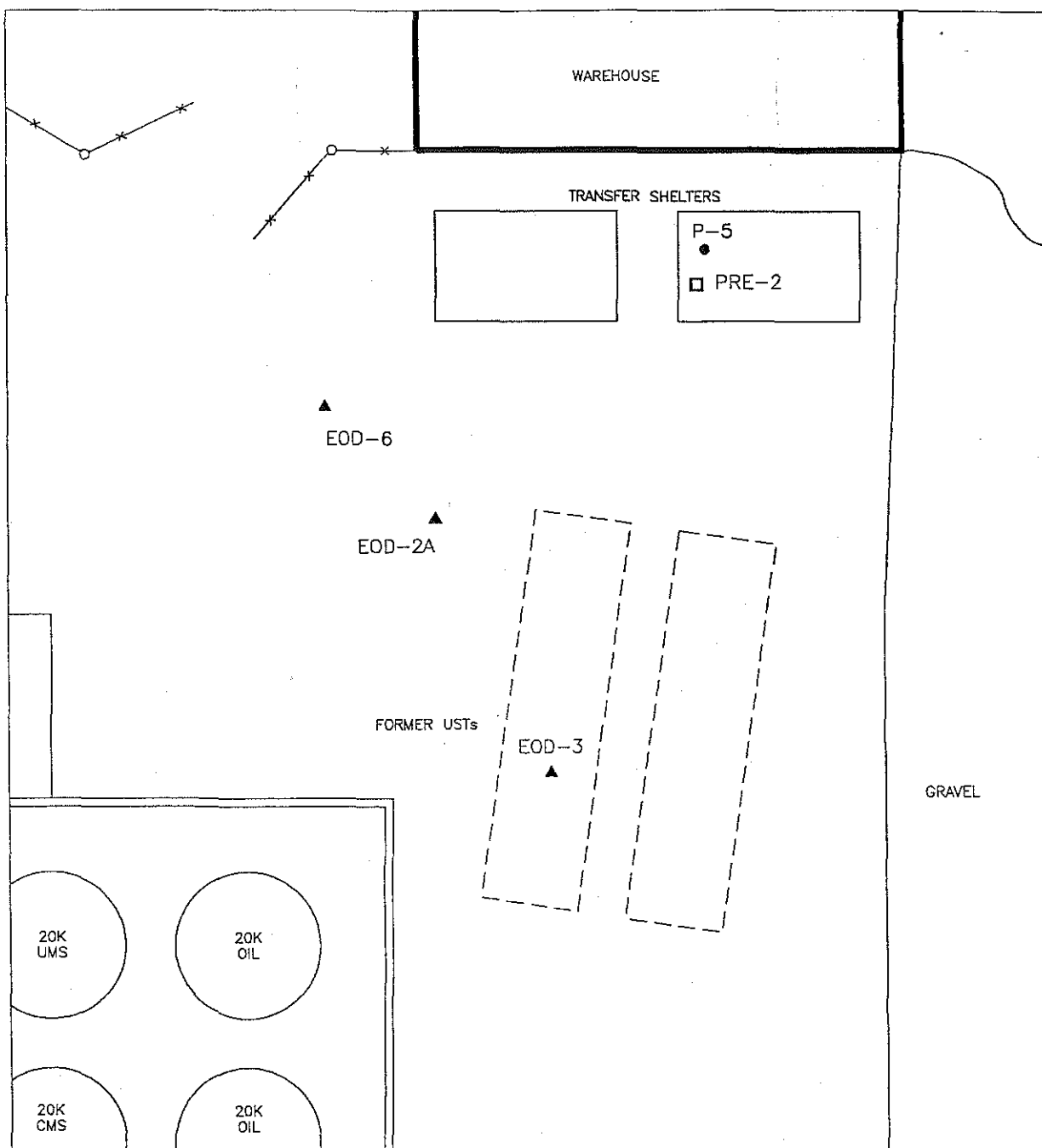
S-K proposes to demonstrate that soil quality has been remedied to the extent necessary to achieve clean closure by collecting and analyzing soil samples from the areas of documented worst-case degradation. Soil borings will be constructed at the four locations of highest degradation encountered during previous soil assessments. These locations are shown on Figure 4-5. Soil sampling and analytical procedures will be the same as described in Chapter 2.0. Soil samples will be collected and analyzed from each borehole from the same depth intervals as during previous assessments.

The four verification soil samples will be analyzed for mineral spirits, methylene chloride, TCLP cadmium and TCLP lead. Results of the analyses will be evaluated to determine whether the soil quality degradation has been remedied to the extent necessary to achieve clean closure.

#### 4.4.2 Evaluation of Ground-Water Remediation Progress

S-K proposes to monitor ground-water quality throughout the extended closure period. Initially, ground water will be monitored quarterly; however, the frequency may be modified (i.e., semiannually or annually) as remediation progresses. Ground-water monitoring will be performed in accordance with the procedures described in the EOD Workplan dated September 14, 1993, and with the relevant conditions of the IEPA approval letter dated April 11, 1994. Ground-water elevations will be measured to confirm ground-water flow direction. Ground-water quality samples will be collected from wells within and down-gradient of the impacted area (see Figure 4-4), and analyzed for the constituents of concern determined during the assessment described in Section 4.2.

The results of the ground-water monitoring program will be submitted to IEPA in Closure Progress Reports following receipt of analytical data from each event. S-K will use the results of the ground-water monitoring program to document remedial progress, modify remediation systems if necessary, and demonstrate clean closure.



EXPLANATION

- ▲ EOD SOIL BORING LOCATION (8/94)
- PRE-EXCAVATION SOIL BORING (7/91)
- PIPE RUN SAMPLES (8/91)

0 10 ft.  
SCALE



FIGURE 4-5 :LOCATIONS OF HIGHEST DEGRADATION ENCOUNTERED DURING SOILS ASSESSMENTS TO DATE, SAFETY-KLEEN CORP. SERVICE CENTER, PEKIN, ILLINOIS (August 1994)

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#### 4.4.3 Clean Closure Documentation

S-K will submit quarterly Closure Progress Reports during closure. The reports will include a summary of remediation activities performed during the quarter, a summary of field and laboratory data collected during the quarter, problems encountered during the quarter, and solutions implemented or planned.

S-K will prepare a closure certification report within 60 days following receipt of complete and accurate laboratory data indicating that the clean closure objectives have been achieved. The contents of the closure certification report are described in Condition 3 of the IEPA letter dated April 11, 1994.

## CHAPTER 5.0

### REFERENCES

- Varljen, M.D., and J.M. Shafer, 1993, Coupled Simulation-Optimization Modeling for Municipal Ground-Water Supply Protection: *Ground Water*, v. 31, no. 3, pp. 401-409.
- Walker, W.H., R.E. Bergstrom, and W.C. Walton, 1965, Ground-Water Resources of the Havana Region in West-Central Illinois: Illinois State Water Survey, Urbana, Cooperative Ground-Water Report 3.

APPENDIX A

PERTINENT CORRESPONDENCE  
EXTENT OF DEGRADATION INVESTIGATION  
SAFETY-KLEEN CORP. SERVICE CENTER  
PEKIN, ILLINOIS





State of Illinois  
ENVIRONMENTAL PROTECTION AGENCY

Mary A. Gade, Director  
217/524-3300

2200 Churchill Road, Springfield, IL 62794-9276

December 14, 1993

Safety Kleen  
Attn: Robert Schoepke  
777 Big Timber Road  
Elgin, Illinois 60123

Re: 1790600011 -- Tazewell County  
Safety Kleen/Pekin  
ILD093862811  
Log No. C-531-M-5  
RCRA-Closure

Dear Mr. Schoepke:

This letter is written in response to the document entitled Workplan, Extent of Degradation Investigation, Safety-Kleen Corp. Pekin, Service Center, Illinois, ILD093862811, September 14, 1993, received by the Agency on September 15, 1993. This submittal was handled as a request to modify the approved final closure plan for the one (1) hazardous waste tank (S02). The subject request is hereby approved subject to the following conditions and modifications (it is understood that some of the requirements associated with these conditions and modifications may have been met):

1. This letter supersedes the August 11, 1993 closure plan approval letter.
2. When closure is complete, the owner or operator must submit to the Agency certification both by the owner or operator and by an independent registered professional engineer that the facility has been closed in accordance with the specifications in the approved closure plan.

The attached closure certification form must be used. Signatures must meet the requirements of 35 Ill. Adm. Code Section 702.126. The independent engineer should be present at all critical, major points (activities) during the closure. These might include soil sampling, soil removal, backfilling, final cover placement, etc. The frequency of inspections by the independent engineer must be sufficient to determine the adequacy of each critical activity. Financial assurance must be maintained for the units approved for closure herein until the Agency approves the facility's closure certification.

The Illinois Professional Engineering Act (Ill. Rev. Stat., Ch. 111, par. 5101 et. seq.) requires that any person who practices professional engineering in the State of Illinois or implies that he (she) is a professional engineer must be registered under the Illinois Professional Engineering Act (par. 5101, Sec. 1). Therefore, any certification or engineering services which are performed for a closure plan in the State of Illinois must be done by an Illinois P.E.



As part of the closure certification, to document the closure activities at your facility, please submit a Closure Documentation Report which includes:

- a. The volume of waste, waste residue and contaminated soil (if any) removed. The term waste includes wastes resulting from decontamination activities.
- b. A description of the method of waste handling and transport.
- c. The waste manifest numbers.
- d. Copies of the waste manifests.
- e. A description of the sampling and analytical methods used including sample preservation methods and chain-of-custody information.
- f. A chronological summary of closure activities and the cost involved.
- g. Color photo documentation of closure. Document conditions before, during and after closure.
- h. Tests performed, methods and results.

The original and two (2) copies of all certifications, logs, or reports which are required to be submitted to the Agency by the facility should be mailed to the following address:

Illinois Environmental Protection Agency  
Bureau of Land -- #33  
Permit Section  
2200 Churchill Road  
Post Office Box 19276  
Springfield, Illinois 62794-9276

3. If the Agency determines that implementation of this closure plan fails to satisfy the requirements of 35 Ill. Adm. Code, Section 725.211, the Agency reserves the right to amend the closure plan. Revisions of closure plans are subject to the appeal provisions of Section 40 of the Illinois Environmental Protection Act.
4. Safety-Kleen has proposed sampling locations to be used as background samples. This Agency recommends that an attempt to define the horizontal and verticle extent of contamination present above the concentrations listed in Condition 6 be determined prior to collecting background samples. If Safety-Kleen desires to collect background samples, then a minimum of ten (10) are required from each soil horizon of concern to establish cleanup objectives.

5. Any report submitted to the Agency by Safety-Kleen proposing cleanup objectives based upon background concentrations must include the following information regarding the background sampling/analysis effort (such a report shall be submitted to the Agency within 90 days of the Agency receiving the report referred to in Condition 6 below regarding the implementation of this subject conditioned and modified approved closure plan):
  - a. A scaled drawing showing each background soil sample location. Samples must be collected from areas unaffected by the operations of the facility;
  - b. The depth from which the samples will be collected;
  - c. The procedures which will be used to collect the samples;
  - d. The parameters which will be analyzed for;
  - e. The analytical methods to be used;
  - f. The statistical method to be used in evaluating the data. An acceptable method can be found in Chapter 9, Table 9-1, Equation 6 of Test Methods for Evaluating Solid Waste, Third Edition (SW-846).
6. Safety-Kleen shall determine the horizontal and vertical extent of soil and groundwater which contains constituents in concentrations higher than those in the table below. The results of the investigation necessary to make this determination should be submitted to the Agency in the form of a report which must be submitted within ninety (90) days after the laboratory analytical results have been received by Safety-Kleen.

<u>Contaminant</u>	<u>Soil Concentration (mg/kg)(1)</u>	<u>Groundwater Concentration (mg/l)(1)</u>
<u>Inorganics</u>		
Arsenic	0.05*	0.05
Cadmium	0.005*	0.005
Chromium	0.1*	0.1
Lead	0.0075*	0.0075
<u>Organics</u>		
Acetone	0.7	0.7
Bis(2-ethyl-hexyl)phthalate	0.33	0.01
Di-n-butyl-phthalate	14.0	0.7
Ethylbenzene	0.7	0.7
Isophorone	1.4	1.4
Methylene Chloride	0.005	0.005
Mineral Spirits	50.0	0.5
Xylenes	10.0	10.00

- \* Value is based on the analysis of the extract of the TCLP test (Method 1311 in SW-846). Thus the actual unit of measure for these values in the table above in mg/l.

- (1) These concentrations may be adjusted if Safety-Kleen provides information in any report documenting the results of any sampling/analysis effort that the levels could not be achieved using standard laboratory practice.
7. The determination required by Condition 6 above as it relates to a soil investigation should be determined in general accordance with Sections 13.a and 13.b of the Agency's closure plan instructions (revised December 19, 1990). However, no random sampling shall be used in this investigation. Note that soil samples should later occur along the bottom and sidewalls of soil remaining after the removal of any contaminated soils resulting from the closure activities in accordance with the Agency's closure plan instructions. Such efforts must be implemented for demonstrating clean closure should excavation be the chosen form of remediation.
  8. Based upon the Agency review of the subject workplan, further soil investigation(s) is recommended in the following manner to initiate the achievement of the goals outlined above in Condition 6 for soil.
    - a. Soil samples should be taken deeper than 1-2' at locations P-1, P-2, P-4, and P-7 where lead and mineral spirits contamination was detected. The goal of this effort is to define the vertical extent of degradation present at these locations.
    - b. Soil sample(s) should be taken deeper than 1-2' at location P-6 where lead contamination was detected. The goal of this effort is to define the vertical extent of contamination present at this location.
    - c. Soil samples should be taken extending from the locations referred to above in items a. through b. such that the horizontal extent of contamination from these locations can be determined.
    - d. Soil sample(s) should be taken at location PRE-2 where mineral spirits contamination was detected. The soil sample(s) should be taken deeper than the 1-3' interval and shallower than the 13-15' interval where past soil sampling has occurred.
    - e. Soil samples should be taken extending from the location referred to above in item d. such that the horizontal extent of contamination from this location can be determined.
    - f. Soil sampling should take place directly beneath the previous locations of the underground tanks referred to as "Former Location of 12,000 Gal. Spent Solvent UST" and "Former Location of 12,000 Gal. Product UST". The vertical intervals should begin at a depth directly below the bottoms of the former tanks. At least 4 sample locations should be taken beneath each of the former tank bottom locations.



- g. Soil sample(s) should be taken deeper than 3-5' at location PRE-4 where arsenic contamination was detected.
  - h. Soil samples should be taken extending from the location referred to above in item g. such that the horizontal extent of contamination from this location can be determined.
- 9. The parameters proposed for analysis in Table IV-2 of the subject submittal are hereby approved.
- 10. Within 90 days after the receipt of results from implementation of the subject plan submitted and approved by the Agency pursuant to Conditions 6 through 9 above, Safety-Kleen shall submit those results to the Agency for review and approval. In addition, this submittal may propose site-specific soil cleanup objectives Safety-Kleen feels are necessary along with the bases for those proposed objectives. These objectives must meet the closure performance standards of 35 IAC 725.211, 725.214 and 725.297. Guidance for the development of site-specific cleanup objectives had been previously provided to Safety-Kleen. It must be noted that use of PID readings, total testing for inorganics, and the TCLP test for volatile organic compounds in establishing cleanup objectives in soil may not be acceptable, as no information has yet been provided demonstrating that this procedure would meet the aforementioned closure performance standards.
- 11. All necessary cleanup objectives for groundwater must meet the requirements of 35 IAC 620, including the procedures set forth in 35 IAC 620, Subpart F for establishing objectives for constituents which do not have standards. A groundwater management zone meeting the requirements of 35 IAC 620 must be established, as necessary.
- 12. Safety-Kleen shall submit a separate report describing any necessary and appropriate proposed remedial measures to meet the site-specific cleanup objectives once the work required by Conditions 6 through 9 above have been completed. This report must be submitted within 90 days of receipt of the results from implementation of the plan under Conditions 6 through 9, or if Safety-Kleen proposes site-specific levels in accordance with Condition 10 above, within 60 days of receipt of Agency-approved site-specific cleanup levels. This plan must describe in detail the proposed remediation activities and it must include scaled drawings, design specifications, supporting calculations, etc. as necessary to support the proposed remediation effort.
- 13. The report required by Condition 6 above shall provide information documenting the results of all sampling/analysis efforts. the goal of presenting this information should be to describe, in a logical manner, the activities and results associated with the sampling/analysis effort. At a minimum, this information must include:
  - a. identification of the reason for the sampling/analysis effort and the goals of the effort;

- b. a summary in tabular form of all analytical data, including all quality assurance/quality control data;
- c. a scaled drawing showing the horizontal location from which all soil samples were collected;
- d. plan view drawings which identify the constituent concentration at each location which is detected above the corresponding concentration in Condition 6 of this letter (note please include past constituents detected above the concentrations as well). In preparing these drawings please take into account the following:
  - 1. somewhere on the drawings, the level of the concentration for all corresponding constituents of concern in Condition 6 should be presented.
  - 2. These drawings should be described in text as how they relate to defining the vertical and horizontal extent of contamination on the site for soil and groundwater and how they relate to future sampling efforts and/or remediation efforts.
  - 3. The vertical intervals that reach the soil concentrations in Condition 6 should also be represented on the scaled drawings showing the level of detection or non-detection of the parameter(s) of concern.
  - 4. Such scaled drawings may need to be presented/plotted on paper much larger than 8 1/2 " x 11" in size to contain the necessary information referred to above.
  - 5. Items a through d above should also be conducted for any groundwater test results in the future.

The above efforts and organization will make the evaluation of the vertical and horizontal extent of contamination more efficient.

- e. a summary identifying all parameters at each sample location that did not achieve a detection limit at least as low as the concentrations listed in Condition 6 of this letter. This should be easily cross-referenced with the subject drawings;
- f. identification of the depth and vertical interval from which each sample was collected;
- g. a description of the soil sampling procedures, sample preservation procedures and chain of custody procedures;
- h. identification of the test method used (including Method number from SW-846), actual constituents analyzed for and detection limits achieved, including sample preparation, sample dilution (if necessary) and analytical inferences;

- i. copies of the final laboratory report sheets, including final sheets reporting all quality assurance/quality assurance dates;
  - j. visual classification of each soil sample in accordance with ASTM D-2488;
  - k. a summary of all procedures used for quality assurance/quality control, including the results of these procedures;
  - l. a discussion of the data, as it relates to the overall goal of the sampling/analysis effort; and
  - m. all sampling results taken to date shall be provided as an Appendix. these sampling results shall be easily cross-referenced with the drawings and summaries referred in the above applicable items in this Condition.
14. The procedures used to collect the soil samples must be sufficient so that all soil encountered is classified in accordance with ASTM Method D-2488.
15. If a drill rig or similar piece of equipment is necessary to collect required soil samples, then:
- a. the procedures specified in ASTM Method D-1586 (Split Spoon Sampling) or D-1587 (Shelby Tube Sampling) must be used in collecting the samples;
  - b. Soil samples must be collected continuously at several locations to provide information regarding the shallow geology of the area where the investigation is being conducted.
16. Soil samples not collected explicitly for VOC analysis should be field-screened for the presence of VOCs.
17. All soil samples which will be analyzed for volatile organic compounds must be collected in accordance with Attachment 7 of the Agency's RCRA closure plan instructions;
18. All other soil samples must be collected in accordance with the procedures set forth in SW-846 and must achieve detection limits at least as low as the soil concentrations for all parameters in Condition 6 of this letter.
19. When visually discolored or contaminated material exists within an area to be sampled, horizontal placement of sampling locations shall be adjusted to include such visually discolored and/or contaminated areas. Sample size per interval shall be minimized to prevent dilution of any contamination.
20. All groundwater samples must be collected in accordance with the procedures set forth in SW-846 and analyses of these samples must achieve detection limits at least as low as the groundwater concentrations for all parameters in Condition 6 of this letter.

21. Quality assurance/quality control procedures which meet the requirements of SW-846 must be implemented during all required sampling/analysis efforts.
22. All soil samples shall be analyzed individually (i.e., no compositing). Analytical procedures shall be conducted in accordance with Test Methods for Evaluating Solid Wastes, Third Edition (SW-846). When a SW-846 (Third Edition) analytical method is specified, all the chemicals listed in the Quantitation Limits Table for that method shall be reported unless specifically exempted in writing by the Agency. Apparent visually contaminated material within a sampling interval shall be included in the sample portion of the interval to be analyzed. The Agency recommends that metals be analyzed by TCLP, volatile organics by Method 8240, and semi-volatile organics by Method 8270. It should be noted that the levels identified in Condition 6 above are based on the TCLP test for metals and total concentrations for VOCs and SVOCs.
23. The Agency shall be notified in writing if, at any time, contaminants not listed in Condition 6 are detected above their respective practical quantitation limit. This notification shall identify the additional constituents detected and the concentration at which they were detected. The Agency will review this information and establish cleanup objectives for the newly detected contaminants, if necessary. The sampling and analysis effort being carried out to determine the extent of contamination shall not be delayed while the Agency is reviewing this information.
24. All units and associated appurtenances required to go through closure and be decontaminated shall be steam cleaned and triple rinsed. All wash and rinse waters shall be collected and analyzed for the constituents of concern within this RCRA closure which are outlined in Condition 6 of this letter. If analysis of the wash and rinse waters sampled detect these constituents of concern above the constituent's PQL identified in Test Methods for Evaluating Solid Wastes, Third Edition (SW-846), then the material must be managed as a hazardous waste. If the wash and rinse waters exhibit a characteristic of a hazardous waste then that material must be managed as a hazardous waste. In any event the material must be managed as a special waste.
25. The conceptual contingent closure/post-closure plan is hereby approved. Should Safety Kleen determine that clean closure cannot be achieved, then a more detailed plan must be submitted to the Agency describing the procedures which will be utilized to close the units as landfills and provide post-closure care of such units. Such a plan must contain detailed cost estimates and the financial assurance documents on file with the Agency must also be revised, as necessary, to reflect the revised cost estimates.
26. Safety-Kleen must provide financial assurance in the amount of \$266,590 (1993 dollars) until (1) the site is identified clean-closed or (2) it is determined that the units must be closed as landfills and that a detailed landfill closure/post-closure plan referred to in Condition 25 above.

27. A request for release of financial assurance documents should be included with the closure certification documents.
28. Under the provisions of 29 CFR 1910 (51 FR 15,654, December 19, 1986), cleanup operations must meet the applicable requirements of OSHA's Hazardous Waste Operations and Emergency Response standard. These requirements include hazard communication, medical surveillance, health and safety programs, air monitoring, decontamination and training. General site workers engaged in activities that expose or potentially expose them to hazardous substances must receive a minimum of 40 hours of safety and health training off site plus a minimum of three days of actual field experience under the direct supervision of a trained experienced supervisor. Managers and supervisors at the cleanup site must have at least an additional eight hours of specialized training on managing hazardous waste operations.
29. 35 IAC 721.131 F001 through F005 wastes must be disposed in accordance with 35 IAC Part 728.
30. To avoid creating another regulated storage unit during closure, it is recommended that you obtain any necessary permits for waste disposal prior to initiating excavation activities. If it is necessary to store excavated hazardous waste on-site prior to off-site disposal, do so only in containers or tanks for less than ninety (90) days. Do not create regulated waste pile units by storing the excavated hazardous waste in piles. The ninety (90) day accumulation time exemption (35 IAC 722.134) only applies to containers and tanks.
31. Please be advised that the requirements of the Responsible Property Transfer Act (Public Act 85-1228) may apply to your facility due to the management of RCRA hazardous waste. In addition, please be advised that if you store or treat on-site generated hazardous waste in containers or tanks pursuant to 35 IAC 722.134, those units are subject to the closure requirements identified in 35 IAC 722.134(a)(1).
32. All hazardous wastes that result from this project are subject to annual reporting as required in 35 IAC 722.141 and shall be reported to the Agency by March 1 of the following year for wastes treated and left on-site or shipped off-site for storage, treatment and/or disposal during any calendar year. Additional information and appropriate report forms may be obtained from the Agency by contacting:

Facility Reporting Unit  
Bureau of Land  
Illinois Environmental Protection Agency  
2200 Churchill Road  
P.O. Box 19276  
Springfield, Illinois 62794-9276

33. The Agency must be notified in writing if, at any time, it is found that soil contamination above the established cleanup objectives extends to near the water table. This notification must be made within 15 days after such a discovery is made. A plan to investigate for potential groundwater contamination must be submitted to the Agency for review and approval within 60 days after the initial written notification is submitted to the Agency.
34. If groundwater is encountered during the soil sampling activities prior to reaching soil which meets the cleanup objectives, then a plan to investigate for potential groundwater contamination must be submitted to the Agency for review and approval. Such a plan must be submitted within sixty (60) days after the date that the analytical results are received which indicate that soil contamination extends to the water table. In addition, the Agency shall be notified in writing of this discovery within five (5) days after these analytical results are received.
35. Contaminated soil may be excavated and disposed off-site at any time during closure. The goal of any such effort should be to remove all soil which exceeds the established cleanup objectives.
36. If removal and off-site disposal is the remedial action chosen for any soil contamination found, then all contaminated soil which is excavated for off-site disposal must be managed as hazardous waste in accordance with 35 IAC 722, 723, 728 and 809, as well as all applicable federal requirements.
37. If removal and off-site disposal is the remedial action chosen for any soil contamination found, then soil samples must be collected for analysis from the bottom and sidewalls of the final excavation from which contaminated soil was removed. This sampling analysis effort necessary to demonstrate that the remaining soil meets the established cleanup objectives.
  - a. A grid system as set forth in Section 13.b of the Agency's closure plan instructions must be established over the excavation.
  - b. Samples must be collected from the floor of the excavation at each grid intersection, including intersections along the perimeter of the excavation.
  - c. Samples must be collected 6"-12" below the ground surface at each grid intersection around the excavation perimeter. Samples must also be collected at the midpoint of the excavation wall at each grid intersection along the excavation perimeter.
  - d. Collection/analysis of all required samples must be in accordance with the procedures approved in this letter.

- e. Soil samples which must be analyzed for volatile organic compounds shall be collected using Attachment 7 of the Agency's RCRA closure plan instructions. In addition, such samples must be collected 6"-12" beneath the floor/sidewalls of the excavation to minimize the possibility of volatilization of the contaminants prior to the collection of the samples.
  - f. No random sampling shall be conducted to verify that the cleanup objectives have been met.
38. If removal and off-site disposal is the remedial action chosen for any soil contamination found, then additional soil must be removed, as necessary, until it can be demonstrated that the remaining soil in and around the area of concern meets the established cleanup objectives. Additional samples must be collected and analyzed in accordance with Condition 6 above from areas where additional soil has been removed.
39. The proposed groundwater investigation plan should be developed in a manner similar to that required for groundwater monitoring programs set forth in 35 IAC 724, Subpart F. Guidance for the development of such a plan can be found in the USEPA documents entitled RCRA Groundwater Technical Enforcement Guidance Document and Handbook of Suggested Practices for the Installation of Groundwater Monitoring Wells.
40. The proposed procedures for conducting a groundwater investigation cannot be approved at this time for the following reasons:
- a. If it is determined that a groundwater monitoring plan is necessary then the plan must include a boring log from a continuously sampled boring completed to a depth of 10 feet into the uppermost water bearing unit subject to Class I Groundwater Quality Standards or bedrock, whichever is shallower. Also, a discussion of the sampling activities, and the results of all tests conducted during the hydrogeologic investigation will need to be submitted. (Note that the remaining Conditions of this letter address groundwater monitoring).
  - b. The drilling and monitoring well installation activities will need to be addressed. The drilling method and decontamination procedures should be discussed. All drilling equipment that will encounter formation materials (e.g., augers, samplers, tremie pipes, bailers for well development, etc.) must at a minimum be decontaminated between boreholes, and in the case of samplers, between samples. Well casing and screen materials must be cleaned prior to installation to remove any coatings or manufacturing residues unless certified by the NSF as being factory sterilized. The general cleaning procedure for drilling equipment should include washing the equipment with potable water and/or hot pressurized potable water. For more contaminated equipment, this procedure should be followed by

a wash with no-phosphate detergent and a final rinse with potable water. When formation samples are being collected for chemical analysis, the cleaning procedure followed must be analogous to that for groundwater sampling equipment.

- c. The proposed Typical Monitoring Well Completion Detail should be modified to address the following details:
  - 1. Stick-up well completions need to have an inner well casing cap that is vented to allow the water levels within the well to respond naturally to barometric pressure.
  - 2. The monitoring well surface seal needs to extend at least 1 foot below frost depth to prevent potential well damage caused by frost heaving.
  - 3. The Agency recommends that Safety Kleen follow 77 IAC 920.170 Monitoring Wells, so that the filter pack does not extend greater than 6 inches below the bottom of the screen.
- d. The screen length must be no less than 5 feet and no greater than 10 feet. Should Safety Kleen desire to vary from these dimensions an acceptable justification should be provided.
- e. The procedures for installation of the filter pack and the annular sealants need to be discussed. Specifically the filter pack, the bentonite seal and the annular sealant material must be installed in a manner that prevents bridging.
  - 1. Filter pack material installed below the water table should generally be tremied into the annular space.
  - 2. In deep wells (greater than 30 feet deep) the bentonite seal must be placed around the casing by means of a tremie pipe. In shallow wells (less than 30 feet deep) they may be dropped directly down the annulus. In shallow wells, a tampering device must be used to prevent bridging from occurring. The bentonite seal must be allowed to completely hydrate, set or cure in conformance with the manufacturer's specifications prior to installing the grout seal in the annular space.
  - 3. The cement grout must be emplaced with a side discharge tremie pipe. The discharge end of the tremie pipe must remain approximately 1 foot below the surface of the grout during emplacement, and the tremie must be kept full of grout without airspace.
- f. Flush-to-ground surface completions should only be used in active roadways and parking lots. Where flush-to-ground surface completions are installed, the protective well casing should be provided with a watertight O-ring to prevent infiltration of surface water into the inner well casing.



- g. When installing above-ground well completions the following items should be addressed:
  - 1. In above-ground well completions the stick-up protective well casings must be vented to allow the water levels within the well to respond naturally to barometric pressure. The protective casing must also be provided with a drain to prevent water from accumulating around the inner well casing and, in freezing climates, damaging the well casing.
  - 2. Stick-up protective well casings must be protected against accidental damage by vehicular traffic by a minimum of 3 brightly colored concrete or steel bumper guards installed within 3 or 4 feet of well.
- h. For a longterm investigation of organic contaminants in the saturated zone, monitoring wells should be constructed with stainless steel (i.e. SS304 or SS316).
- i. The specific waste disposal activities for drill cuttings, well development water, and/or decontamination fluids and residues on site prior to disposal need to be clearly indicated. To avoid creating a regulated storage unit during closure, it is recommended that any necessary permits for waste disposal be obtained prior to initiating the groundwater investigation activities. If it is necessary to store drill cuttings, well development water, and/or decontamination fluids and residues on site prior to disposal, do so only in containers or tanks for less than 90 days. The ninety day accumulation time exemption (35 IAC 722.134) only applies to containers and tanks.
- j. The documentation of piezometer/monitoring well installation and construction have need to be clearly indicated. However, it is general Agency procedure to complete Well Completion Reports for all piezometer/monitoring well completions.
- k. The monitoring well surveying activities of each well's horizontal and vertical coordinates and their distances from the units being monitored must be reported. Also, each well's location in respect to all other wells in the monitoring system and the regulated unit(s) should be indicated. The horizontal location of all wells/piezometers must be determined to  $\pm 0.1$  ft. and the vertical location of all wells/piezometers must be determined to within  $\pm 0.01$  ft. The height of the reference survey datum (either State Plane Coordinate System or the Universal Transverse Mercator System) permanently marked on the inner well casing should be determined in relation to mean sea level, which in turn is established by reference to an established National Geodetic Vertical Datum. The reference marked on top of the inner well casing should be resurveyed at least once every 5 years.

- l. The groundwater sampling procedures should include a determination of the monitoring wells depth. Specifically, the monitoring wells depth as well the static water level in each monitoring well must be determined prior to each sampling event. Also the procedure for determining the thickness of any immiscible layers encountered should be determined. The procedures and equipment used to determine the immiscible layers thickness must also be described.
- m. The procedure for monitoring well purging should include the removal of at least 3 well volumes of groundwater and the measurement of pH, specific conductivity, and temperature. Once the above mentioned parameters have stabilized to within 10% over two consecutive measurements, the well may be sampled. Purging must be at a rate slower than that used to develop the well so as to prevent stripping of VOCs from the groundwater.
- n. When collecting groundwater samples for organic analysis the sampling equipment should be decontaminated as follows:
  1. All equipment which will come into contact with the well casing or groundwater sample during sampling activities must be decontaminated as follows:
    - a) a nonphosphate detergent wash
    - b) a tap water rinse;
    - c) a rinse with a pesticide-grade hexane or methanol;
    - d) a rinse with a reagent grade isopropanol (or a solvent which is not a target analyte); and,
    - e) a rinse with an organic-free reagent water.
  2. When organic analytes are not being sampled, Steps 3) and 4) must be substituted with a dilute (0.1N) hydrochloric or nitric acid rinse.
- o. To ensure the collection of representative samples, groundwater sampling activities should follow Agency guidelines. Specifically, sampling should proceed from the well least likely to be contaminated to the well most likely to be contaminated, also the collection of groundwater samples should generally begin with the most chemically and physically active analytes and end with the least active analytes.

Sampling must progress from the well that is expected to be least contaminated to the well that is expected to be most contaminated. Samples must be collected and containerized according to the volatility of the target analytes as follows:

- 1) Volatile organics (VOAs or VOCs) and total organic halogens (TOX);
- 2) Dissolved gases and total organic carbon (TOC);
- 3) Semivolatile organics (SMVs or SVOCs);
- 4) Metals and cyanide;
- 5) Major water quality cations and anions;
- 6) Radionuclides.

Decontaminated sampling equipment must not be allowed to come into contact with the ground or other contaminated surface prior to installation into the well. The groundwater sample must be collected, if possible, within two hours of purging the well.

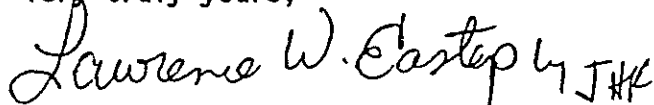
- p. The method of preservation, as found in Table 2-21 of SW-846, as well as the procedures for collecting representative samples of each constituent of concern should be indicated. Also, the procedures used to ensure that the sampling containers are free of contamination prior to use should be described. When collecting groundwater samples which may contain organic constituents, no headspace should exist in the containers.
- q. The procedures to ensure sample identity and integrity by providing a proper chain-of-custody should be discussed. Also, the information to be recorded on the chain-of-custody form should be elaborated upon. Chain-of-custody procedures to prevent misidentification of the samples, to prevent tampering with the samples during shipping and storage, to allow easy identification of any tampering, and to allow for the easy tracking of possession. At a minimum, the chain-of-custody procedures must include:
  1. Sample label placed on each sampling container that indicates the samples' identification number, the name and signature of collector, the date and time of collection, the place of collection, and the parameters requested.
  2. Sample custody seals placed on the shipping container or on the individual sample bottles.
  3. A chain of custody record that indicates the sample number, the signature of collector, the date and time of collection, the sample type (e.g., groundwater, the identification of sampling point (well), the number of containers, the analysis requested, the preservatives used, the signature of persons involved in the chain of possession, the inclusive dates and times of possession, the internal temperature of shipping container when sample are sealed into the container for shipping, the internal temperature when opened at the laboratory, and a remarks section to identify potential hazards or to relay information to the laboratory.

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41. A revised groundwater investigation plan addressing the deficiencies in Condition 40 above must be submitted to the Agency by January 31, 1994.

Should you have any questions regarding this matter, or if you have any questions while carrying out the required closure activities, please contact Gregg Sanders or Ron Hewitt at 524-3300.

Very truly yours,

A handwritten signature in cursive script that reads "Lawrence W. Eastep" followed by the initials "LWE".

Lawrence W. Eastep, P.E., Manager  
Permit Section  
Division of Land Pollution Control  
Bureau of Land

LWE:GS:sf/sp/1021Y,1-16

cc: TriHydro Corporation  
USEPA Region V -- George Hamper



January 19, 1994

Mr. Lawrence Eastep, Manager  
Permit Section  
Division of Land Pollution Control  
Illinois EPA  
2200 Churchill Road  
Springfield, IL 62794-9276

ATTN: Mr. Gregg Sanders

Subject: Extent Of Degradation Investigation, Safety-Kleen Corp.  
Service Center, Pekin, Illinois (ILD093862811)

Dear Mr. Eastep:

In a letter dated December 14, 1993, the Illinois Environmental Protection Agency (IEPA) approved the Pekin Extent Of Degradation (EOD) Investigation Workplan (September, 14, 1993) with conditions. The purpose of this letter is to respond to several of the Pekin conditions of approval. The responses focus on clarification and maintaining consistency between the Pekin and other Illinois projects. A copy of the IEPA letter dated December 14, 1993, is attached for reference to the following conditions/modifications.

Safety-Kleen Corp. (S-K) has been working with the IEPA on similar closure/assessment projects at the Mokena, Arlington Heights and Schaumburg service centers. Workplans to evaluate the extent of degradation at the Pekin, Arlington Heights, and Schaumburg service centers were submitted to IEPA in response to resolution of appeals. S-K recently worked out conditions of approval with IEPA for the Arlington Heights and Schaumburg EOD investigations. Responses to the Pekin conditions/modifications of approval are presented below:

Condition Nos. 1-3. No response necessary.

Condition No. 4. S-K concurs that the extent of degradation should be identified prior to collecting background soil samples. The proposed background soil sampling locations were selected based on knowledge of the site and experience at numerous other S-K facilities. If necessary, the proposed background sampling locations will be modified to ensure background samples are collected from areas unimpacted by the facility.

S-K believes that collection of 10 samples is unnecessary to establish background soil quality. The RCRA ground-water monitoring regulations require collection of a minimum of four samples to statistically document background conditions. However, to address this IEPA concern, a minimum of 10 samples will be

collected from each soil horizon to establish background soil quality and establish appropriate clean-up objectives.

Condition No. 5. No response necessary to items a-e of this condition. IEPA has recommended the use of Equation 6 from Table 9-1, Chapter 9 of USEPA SW-846. This method appears inappropriate because it results in a confidence interval around the mean background concentration of each constituent. Individual constituent concentrations cannot be reasonably compared to a mean background concentration. Two accepted approaches to comparing verification data to background are summarized as follows:

1. If the mean background concentrations are established as the clean-up standards (i.e. confidence intervals), then only the mean of all verification sample concentrations could reasonably be compared to this standard; or
2. If all of the individual verification sample concentrations are compared to respective background-based standards, then the standard must be derived from the range of background data. A method of performing this comparison is the tolerance interval method, described in USEPA's "Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Final Guidance" (April 1989 and January 1993 addendum).

A tolerance interval is designed to include a stated percentage of the range of expected background data, as opposed to a confidence interval which is designed only to contain the mean background concentration. Therefore, mean background concentrations can be compared to the mean of all the verification sample concentrations, or the range of background concentrations can be compared to the concentrations (i.e. range) encountered in the verification samples.

Condition No. 6. This condition presents target constituents and respective concentrations for determining the extent of subsurface degradation. Target concentrations or specified detection limits may not always be achievable due to analytical capabilities and matrix interferences, as indicated in the appeal and footnote of this condition. A target soil concentration of 0.0075 mg/L TCLP lead is presented in this condition and Table IV-2 of the Workplan. It should be noted that two independent laboratories have indicated that a detection limit of 0.0075 mg/L of lead in a TCLP extract may not be analytically achievable. S-K recommends the TCLP lead concentration be modified equivalent to the Mokena target level of 0.05 mg/L, to avoid future confusion and maintain consistency.

Condition No. 7. No response necessary at this time.

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January 19, 1994  
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Condition No. 8. The objective of the proposed investigation is to determine the extent of subsurface degradation associated with the former USTs. Soil sampling was performed over a relatively small area (approximately 40 X 50 feet) during the previous assessment activities. S-K believes the sampling scheme recommended in this Condition is unnecessary to accomplish the investigation objective.

S-K proposes to evaluate the extent of degradation according to the procedures presented in the Workplan. In the Workplan, S-K proposed a soil boring/sampling location in the immediate vicinity of the previous pipe run samples. Additional boreholes will be constructed and sampled around the former pipe run area to determine the extent of degradation, as necessary. Therefore, the areas of concern identified by IEPA will be addressed during this investigation.

Condition No. 9. No response necessary.

Condition Nos 10-12. No response necessary at this time.

Condition No. 13. This condition outlines information which should be presented in the proposed assessment report. S-K intends to address these requirements to the extent practical and necessary to accomplish the objectives of this investigation.

Condition Nos. 14-16. No response necessary at this time.

Condition No. 17. As proposed in the Workplan, soil samples will be collected in accordance with the IEPA "Soil Volatile Sampling Procedures," with one exception - S-K recommends the use of Teflon sheeting instead of aluminum foil. Based on experience, commercially available aluminum foil may contain small amounts of process oil. Also note, the occurrence of noncohesive sand, gravel, and cobbles may preclude the use of brass sampling rings. In this event, S-K will coordinate an alternate sampling procedure with IEPA.

Condition Nos. 18-21. No response necessary at this time.

Condition No. 22. Condition 6 presents the list of constituents which will be evaluated to determine the extent of degradation. This list was developed with IEPA during resolution of the original conditions under appeal. This condition stipulates "when a SW-846 (Third Edition) analytical method is specified, all chemicals listed in the Quantitation Limits Table for that method shall be reported unless specifically exempted in writing by the Agency". As per previous discussions, S-K understands this IEPA stipulation was intended as a recommendation rather than a requirement. Therefore, as per the resolution of the original conditions under

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appeal, S-K intends to evaluate the extent of degradation based on analysis of target constituents listed in Condition No. 6.

Condition No. 23. Condition not applicable. Reference response to Condition No. 22.

Condition No. 24. Condition not applicable. The former USTs, piping and appurtenances have already been decontaminated in accordance with the IEPA-approved closure plan. Note, S-K will manage additional wash/rinse waters which may be generated during the additional closure activities in accordance with applicable regulations.

Condition No. 25-28. No response necessary at this time.

Condition No. 29. Condition not applicable. F001 through F005 solvents were not managed in the units subject to this closure project. The former UST was used to manage spent mineral spirits, a characteristic hazardous waste, and not an F-listed hazardous waste.

Condition Nos. 30-32. No response necessary at this time.

Condition Nos. 33 and 34. Condition No. 33 indicates that IEPA must be notified within 15 days if S-K discovers soil degradation (above the clean-up objectives) extends to near the water table. Similarly, Condition No. 34 indicates that IEPA must be notified within 5 days following receipt of data which documents soil degradation (above the clean-up objectives) extends to ground water. Note, IEPA eliminated a condition similar to Condition No. 34 from the Mokena approval letter.

S-K recommends clarifying Condition No. 33 to indicate IEPA will be notified within 15 days if soil degradation (above the target levels in Condition No. 6) extends to within 10 feet of the water table. Similarly, Condition No. 34 should be eliminated, or clarified to indicate IEPA will be notified within 5 days following receipt of data which documents that soil degradation (above the target levels in Condition No. 6) extends to ground water. This recommendation is based on the assumption that establishment of mutually agreeable clean-up objectives may be a time consuming process.

Additionally, these conditions request submittal of a ground-water investigation plan within 60 days if soil degradation is discovered to extend near or to the water table. This aspect of Condition Nos. 33 and 34 directly conflict with Condition Nos. 39 through 41. Condition Nos. 39 and 40 present recommendations and guidance for preparing a ground-water investigation plan. Contrary to Condition Nos. 33 and 34, Condition No. 41 requests submittal of a ground-water investigation plan by January 31, 1994.



Condition No. 35. No response necessary at this time.

Condition No. 36. Note, soils impacted with product or spent mineral spirits generally do not exhibit the characteristics of hazardous waste. Previous assessment results indicate soils in the vicinity of former USTs at the Pekin facility do not exhibit the characteristics of hazardous waste. S-K will manage any additional soils generated during this closure project in accordance with applicable IEPA and federal regulations.

Condition No. 37. No response necessary at this time. To date, the most feasible remedial alternative(s) has not been determined for completing partial closure at this site. S-K will work with IEPA to develop a verification soil sampling based on the selected remedial alternative (i.e. excavation/off-site disposal, insitu treatment).

Condition No. 38. No response necessary at this time. Reference response to Condition No. 37.

Condition No. 39. No response necessary. Reference response to Condition Nos. 40 and 41.

Condition No. 40. This Condition presents requirements for a ground-water investigation and indicates the proposed procedures cannot be approved at this time. This condition also stipulates "If it is determined that a ground water monitoring plan is necessary, then the plan must include...Also, a discussion of the sampling activities, and the results of all tests conducted during the hydrogeologic investigation will need to be submitted. (Note that the remaining conditions of this letter address ground water monitoring.)"

The absence or presence of ground-water impacts associated with the former USTs has not yet been determined at this site. The procedures presented in the September 14, 1993, Workplan were proposed to evaluate potential ground-water impacts if the soil boring/sampling and analysis results indicate degradation extends to or near the water table. Therefore, a detailed ground-water investigation and/or monitoring plan appears to be unnecessary at this time. S-K proposes to implement the procedures presented in the Workplan, if evaluation of ground water is determined to be necessary. A detailed investigation and monitoring plan which addresses Condition No. 40, may then be submitted if ground-water degradation associated with the former USTs is present. This approach is consistent with IEPA-approved investigations at other S-K sites (i.e., Arlington Heights, Schaumburg, and Mokena).

Condition No. 41. This Condition requests that a revised ground-water investigation plan be submitted by January 31, 1994. Condition Nos. 33 and 34 request submittal of a ground-water

Mr. Lawrence Eastep, Manager  
January 19, 1994  
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investigation plan within 60-days of discovery that soil degradation extends near or to ground-water. Therefore, Condition No. 41 conflicts with Condition Nos. 33 and 34. As previously mentioned, S-K proposes to implement the procedures presented in the Workplan, if evaluation of ground-water is determined to be necessary. A detailed investigation and monitoring plan may then be prepared and submitted if ground-water impacts associated with the former USTs are present at this site.

S-K appreciates your cooperation and assistance with this project. If you have any questions or would like to further discuss these issues please feel free to contact me at (708) 468-2233.

Sincerely,  
SAFETY-KLEEN CORP.

  
Robert Schoepke  
Senior Project Manager - Remediation

RAS:JB:crk/494

cc: Gary Long (S-K)  
Jim Moore (IEPA)  
TriHydro Corporation



State of Illinois

ENVIRONMENTAL PROTECTION AGENCY

File

JB

Mary A. Gade, Director  
217/524-3300

2200 Churchill Road, Springfield, IL 62794-9276

April 11, 1994

Safety Kleen  
Attn: Robert Schoepke  
1000 N. Randall Road  
Elgin, Illinois 60123

Re: 1790600011 -- Tazewell County  
Safety Kleen/Pekin  
ILD093862811  
Log No. C-531-M-6  
Received: January 20, 1994  
RCRA-Closure

Dear Mr. Schoepke:

This letter is written in response to the Safety Kleen letter dated January 19, 1994 and received by the Agency on January 20, 1994. This submittal which contained a discussion of various conditions of the Agency's December 14, 1993 closure plan approval letter, was handled as a request to modify the approved partial closure plan for one (1) hazardous waste tank (S02) at the above-referenced facility. The subject request is hereby approved subject to the following conditions and modifications (NOTE: The following conditions/modifications are organized in a manner similar to those in the December 14, 1993 letter):

1. This letter supersedes the December 14, 1993 closure plan approval letter.
2. Except as modified by this letter, the additional investigations to be carried out must follow the procedures set forth in the document entitled Workplan, Extent of Degradation Investigation, Safety-Kleen Corp. Service Center, Pekin, Illinois, dated September 14, 1993.
3. When closure is complete, the owner or operator must submit to the Agency certification both by the owner or operator and by an independent registered professional engineer that the facility has been closed in accordance with the specifications in the approved closure plan.

The attached closure certification form must be used. Signatures must meet the requirements of 35 Ill. Adm. Code Section 702.126. The independent engineer should be present at all critical, major points (activities) during the closure. These might include soil sampling, soil removal, backfilling, final cover placement, etc. The frequency of inspections by the independent engineer must be sufficient to determine the adequacy of each critical activity. Financial assurance must be maintained for the units approved for closure herein until the Agency approves the facility's closure certification.

The Illinois Professional Engineering Act (Ill. Rev. Stat., Ch. 111, par. 5101 et. seq.) requires that any person who practices professional engineering in the State of Illinois or implies that he (she) is a professional engineer must be registered under the Illinois Professional Engineering Act (par. 5101, Sec. 1). Therefore, any certification or engineering services which are performed for a closure plan in the State of Illinois must be done by an Illinois P.E.

As part of the closure certification, to document the closure activities at your facility, please submit a Closure Documentation Report which includes:

- a. The volume of waste, waste residue and contaminated soil (if any) removed. The term waste includes wastes resulting from decontamination activities.
- b. A description of the method of waste handling and transport.
- c. The waste manifest numbers.
- d. Copies of the waste manifests.
- e. A description of the sampling and analytical methods used including sample preservation methods and chain-of-custody information.
- f. A chronological summary of closure activities and the cost involved.
- g. Color photo documentation of closure. Document conditions before, during and after closure.
- h. Tests performed, methods and results.

The original and two (2) copies of all certifications, logs, or reports which are required to be submitted to the Agency by the facility should be mailed to the following address:

Illinois Environmental Protection Agency  
Bureau of Land -- #33  
Permit Section  
2200 Churchill Road  
Post Office Box 19276  
Springfield, Illinois 62794-9276

4. If the Agency determines that implementation of this closure plan fails to satisfy the requirements of 35 Ill. Adm. Code, Section 725.211, the Agency reserves the right to amend the closure plan. Revisions of closure plans are subject to the appeal provisions of Section 40 of the Illinois Environmental Protection Act.
5. The Agency and Safety Kleen have agreed that background soil samples will not be collected until after the horizontal and vertical extent of soil containing contaminants above the concentrations listed in Condition 7 below has been determined.

6. Any report submitted to the Agency by Safety-Kleen proposing cleanup objectives based upon background concentrations must include the following information regarding the background sampling/analysis effort (such a report shall be submitted to the Agency within 90 days of the Agency receiving the report referred to in Condition 7 below regarding the implementation of the requirements set forth in this letter):
- A scaled drawing showing each background soil sample location. Samples must be collected from areas unaffected by the operations of the facility;
  - The depth from which the samples will be collected;
  - The procedures which will be used to collect the samples;
  - The parameters which will be analyzed for;
  - The analytical methods to be used;
  - The statistical method to be used in evaluating the data. An acceptable method can be found in Chapter 9, Table 9-1, Equation 6 of Test Methods for Evaluating Solid Waste, Third Edition (SW-846). In addition, the tolerance interval method described in the USEPA document entitled Statistical Analysis of Groundwater Monitoring Data of RCRA Facilities, Interim Final Guidance (April 1989 and January 1993) is an acceptable method.
7. Safety-Kleen shall determine the horizontal and vertical extent of soil and groundwater which contains constituents in concentrations higher than those in the table below. The results of the investigation necessary to make this determination should be submitted to the Agency in the form of a report which must be submitted within ninety (90) days after the laboratory analytical results have been received by Safety-Kleen. Safety-Kleen must attempt to achieve detection limits for the contaminants listed below which are at least as low as the corresponding concentrations listed. Safety Kleen has expressed concerns about not being able to achieve a detection limit of .0075 mg/l for lead. Method 7421 of SW-846 is one acceptable method recommended for detecting lead to the level listed below (see also Note 1 below the following table).

<u>Contaminant</u>	<u>Soil Concentration (mg/kg)(1)</u>	<u>Groundwater Concentration (mg/l)(1)</u>
<u>Inorganics</u>		
Arsenic	0.05*	0.05
Cadmium	0.005*	0.005
Chromium	0.1*	0.1
Lead	0.0075*	0.0075

<u>Contaminant</u>	<u>Soil Concentration (mg/kg)(1)</u>	<u>Groundwater Concentration (mg/l)(1)</u>
<u>Organics</u>		
Acetone	0.7	0.7
Bis(2-ethyl-hexyl)phthalate	0.33	0.01
Di-n-butyl-phthalate	14.0	0.7
Ethylbenzene	0.7	0.7
Isophorone	1.4	1.4
Methylene Chloride	0.005	0.005
Mineral Spirits	50.0	0.5
Xylenes	10.0	10.00

\* Value is based on the analysis of the extract of the TCLP test (Method 1311 in SW-846). Thus the actual unit of measure for these values in the table above in mg/l.

(1) These concentrations may be adjusted if Safety-Kleen provides information in any report documenting the results of any sampling/analysis effort that the levels could not be achieved using standard laboratory practice.

8. The determination required by Condition 7 above as it relates to a soil investigation should be carried in general accordance with Sections 13.a and 13.b of the Agency's closure plan instructions (revised December 19, 1990). However, no random sampling shall be used in this investigation. Note that soil samples should later occur along the bottom and sidewalls of soil remaining after the removal of any contaminated soils resulting from the closure activities in accordance with the Agency's closure plan instructions. Such efforts must be implemented for demonstrating clean closure should excavation be the chosen form of remediation.
9. The sample locations proposed in Figure IV-1 of the September 14, 1993 submittal are hereby approved given that Safety Kleen has acknowledged that contamination exists in the area along the underground piping which was connected to the former USTs.
10. In addition to the soil sampling efforts approved in condition 9 above, soil samples should be collected from at least two locations beneath the bottom of each former tank excavation where the tanks were referred to as "Spent Solvent UST" and "Former Location of 12,000 Gal. Product UST" (A total of at least four soil samples must be collected), given that Safety Kleen has acknowledged that contamination exists in the area of the USTs. These samples should be analyzed for all the constituents listed in Condition 7. In addition, a sufficient number of samples should be collected so that the horizontal and vertical extent of soil containing levels above those set forth in Condition 7 is determined.
11. The parameters proposed for analysis in Table IV-2 of the September 14, 1993 submittal are hereby approved.

12. Within 90 days after the receipt of results from implementation of the subject plan submitted and approved by the Agency pursuant to Conditions 7 through 11 above, Safety-Kleen shall submit those results to the Agency for review and approval. In addition, this submittal may propose site-specific soil cleanup objectives Safety-Kleen feels are necessary along with the bases for those proposed objectives. These objectives must meet the closure performance standards of 35 IAC 725.211, 725.214 and 725.297. Guidance for the development of site-specific cleanup objectives had been previously provided to Safety-Kleen. It must be noted that use of PID readings, total testing for inorganics, and the TCLP test for volatile organic compounds in establishing cleanup objectives in soil may not be acceptable, as no information has yet been provided demonstrating that this procedure would meet the aforementioned closure performance standards.
13. All necessary cleanup objectives for groundwater must meet the requirements of 35 IAC 620, including the procedures set forth in 35 IAC 620, Subpart F for establishing objectives for constituents which do not have standards. A groundwater management zone meeting the requirements of 35 IAC 620 must be established, as necessary.
14. Safety-Kleen shall submit a separate report describing any necessary and appropriate proposed remedial measures to meet the site-specific cleanup objectives once the work required by Conditions 7 through 11 above have been completed. This report must be submitted within 60 days of receipt of Agency approval of the information submitted in accordance with Condition 11, or if Safety-Kleen proposes site-specific levels in accordance with Condition 11 above, within 60 days of receipt of Agency-approved site-specific cleanup levels. This plan must describe in detail the proposed remediation activities and it must include scaled drawings, design specifications, supporting calculations, etc. as necessary to support the proposed remediation effort.
15. The report required by Condition 7 above shall provide information documenting the results of all sampling/analysis efforts. The goal of presenting this information should be to describe, in a logical manner, the activities and results associated with the sampling/analysis effort. At a minimum, this information must include:
  - a. identification of the reason for the sampling/analysis effort and the goals of the effort;
  - b. a summary in tabular form of all analytical data, including all quality assurance/quality control data;
  - c. a scaled drawing showing the horizontal location from which all soil samples were collected;
  - d. plan view drawings which identify the constituent concentration at each location which is detected above the corresponding concentration in Condition 7 of this letter (note please include past constituents

detected above the concentrations as well)). In preparing these drawings please take into account the following:

1. Somewhere on the drawings, the level of the concentration for all corresponding constituents of concern in Condition 7 should be presented.
2. These drawings should be described in text as how they relate to defining the vertical and horizontal extent of contamination on the site for soil and groundwater and how they relate to future sampling efforts and/or remediation efforts.
3. The vertical intervals that reach the soil concentrations in Condition 7 should also be represented on the scaled drawings showing the level of detection or non-detection of the parameter(s) of concern.
4. Such scaled drawings may need to be presented/plotted on paper much larger than 8 1/2 " x 11" in size to contain the necessary information referred to above.
5. Items a through d above should also be conducted for any groundwater test results in the future.

The above efforts and organization will make the evaluation of the vertical and horizontal extent of contamination more efficient.

- e. a summary identifying all parameters at each sample location that did not achieve a detection limit at least as low as the concentrations listed in Condition 7 of this letter. This should be easily cross-referenced with the subject drawings;
- f. identification of the depth and vertical interval from which each sample was collected;
- g. a description of the soil sampling procedures, sample preservation procedures and chain of custody procedures;
- h. identification of the test method used (including Method number from SW-846), actual constituents analyzed for and detection limits achieved, including sample preparation, sample dilution (if necessary) and analytical inferences;
- i. copies of the final laboratory report sheets, including final sheets reporting all quality assurance/quality assurance dates;
- j. visual classification of each soil sample in accordance with ASTM D-2488;
- k. a summary of all procedures used for quality assurance/quality control, including the results of these procedures;



- l. a discussion of the data, is it relates to the overall goal of the sampling/analysis effort; and
  - m. all sampling results taken to date shall be provided as an Appendix. these sampling results shall be easily cross-referenced with the drawings and summaries referred in the above applicable items in this Condition.
16. The procedures used to collect the soil samples must be sufficient so that all soil encountered is classified in accordance with ASTM Method D-2488.
17. If a drill rig or similar piece of equipment is necessary to collect required soil samples, then:
  - a. The procedures specified in ASTM Method D-1586 (Split Spoon Sampling) or D-1587 (Shelby Tube Sampling) must be used in collecting the samples;
  - b. Soil samples must be collected continuously at several locations to provide information regarding the shallow geology of the area where the investigation is being conducted.
18. Soil samples not collected explicitly for VOC analysis should be field-screened for the presence of VOCs.
19. All soil samples which will be analyzed for volatile organic compounds must be collected in accordance with Attachment 7 of the Agency's RCRA closure plan instructions. Teflon may however be substituted for aluminum foil to seal the ends of the tubes. If the type of soil being collected cannot be obtained using a tube sampling device, then the sampling procedures shall be such that (1) agitation/aeration of the sample is minimized and (2) no head space is allowed to remain in the container used to transport the soil to the laboratory.
20. All other soil samples must be collected in accordance with the procedures set forth in SW-846 and must achieve detection limits at least as low as the soil concentrations for all parameters in Condition 7 of this letter.
21. When visually discolored or contaminated material exists within an area to be sampled, horizontal placement of sampling locations shall be adjusted to include such visually discolored and/or contaminated areas. Sample size per interval shall be minimized to prevent dilution of any contamination.
22. All groundwater samples must be collected in accordance with the procedures set forth in SW-846 and analyses of these samples must achieve detection limits at least as low as the groundwater concentrations for all parameters in Condition 6 of this letter.
23. Quality assurance/quality control control procedures which meet the requirements of SW-846 must be implemented during all required sampling/analysis efforts.

24. All soil samples shall be analyzed individually (i.e., no compositing). Analytical procedures shall be conducted in accordance with Test Methods for Evaluating Solid Wastes, Third Edition (SW-846). Apparent visually contaminated material within a sampling interval shall be included in the sample portion of the interval to be analyzed. The Agency recommends that metals be analyzed by TCLP, volatile organics by Method 8240, and semi-volatile organics by Method 8270. It should be noted that the levels identified in Condition 7 above are based on the TCLP test for metals and total concentrations for VOCs and SVOCs.
25. All units and associated appurtenances required to go through closure and be decontaminated shall be steam cleaned and triple rinsed. All wash and rinse waters shall be collected and analyzed for the constituents of concern within this RCRA closure which are outlined in Condition 7 of this letter. If analysis of the wash and rinse waters sampled detect these constituents of concern above the constituent's PQL identified in Test Methods for Evaluating Solid Wastes, Third Edition (SW-846), then the material must be managed as a hazardous waste. If the wash and rinse waters exhibit a characteristic of a hazardous waste then that material must be managed as a hazardous waste. In any event the material must be managed as a special waste.
26. The conceptual contingent closure/post-closure plan is hereby approved. Should Safety Kleen determine that clean closure cannot be achieved, then a more detailed plan must be submitted to the Agency describing the procedures which will be utilized to close the units as landfills and provide post-closure care of such units. Such a plan must contain detailed cost estimates and the financial assurance documents on file with the Agency must also be revised, as necessary, to reflect the revised cost estimates.
27. Safety-Kleen must provide financial assurance in the amount of \$266,590 (1993 dollars) until (1) the site is identified clean-closed or (2) it is determined that the units must be closed as landfills and that a detailed landfill closure/post-closure plan referred to in Condition 25 above.
28. A request for release of financial assurance documents should be included with the closure certification documents.
29. Under the provisions of 29 CFR 1910 (51 FR 15,654, December 19, 1986), cleanup operations must meet the applicable requirements of OSHA's Hazardous Waste Operations and Emergency Response standard. These requirements include hazard communication, medical surveillance, health and safety programs, air monitoring, decontamination and training. General site workers engaged in activities that expose or potentially expose them to hazardous substances must receive a minimum of 40 hours of safety and health training off site plus a minimum of three days of actual field experience under the direct supervision of a trained experienced supervisor. Managers and supervisors at the cleanup site must have at least an additional eight hours of specialized training on managing hazardous waste operations.

30. To avoid creating another regulated storage unit during closure, it is recommended that you obtain any necessary permits for waste disposal prior to initiating excavation activities. If it is necessary to store excavated hazardous waste on-site prior to off-site disposal, do so only in containers or tanks for less than ninety (90) days. Do not create regulated waste pile units by storing the excavated hazardous waste in piles. The ninety (90) day accumulation time exemption (35 IAC 722.134) only applies to containers and tanks.
31. Please be advised that the requirements of the Responsible Property Transfer Act (Public Act 85-1228) may apply to your facility due to the management of RCRA hazardous waste. In addition, please be advised that if you store or treat on-site generated hazardous waste in containers or tanks pursuant to 35 IAC 722.134, those units are subject to the closure requirements identified in 35 IAC 722.134(a)(1).
32. All hazardous wastes that result from this project are subject to annual reporting as required in 35 IAC 722.141 and shall be reported to the Agency by March 1 of the following year for wastes treated and left on-site or shipped off-site for storage, treatment and/or disposal during any calendar year. Additional information and appropriate report forms may be obtained from the Agency by contacting:  
  
Facility Reporting Unit  
Bureau of Land  
Illinois Environmental Protection Agency  
2200 Churchill Road  
P.O. Box 19276  
Springfield, Illinois 62794-9276
33. If groundwater is encountered during any soil sampling activities prior to reaching soil which meets the concentrations in Condition 7, or if it is encountered during any soil removal effort, then a plan to investigate for potential groundwater contamination must be submitted to the Agency for review and approval within sixty (60) days after the date that the analytical results are received which indicate that soil degradation above the concentrations in Condition 7 extends to the water table. In addition, the Agency shall be notified in writing of this discovery within five (5) days after Safety-Kleen receives these analytical results in writing.
34. Contaminated soil may be excavated and disposed off-site at any time during closure. The goal of any such effort should be to remove all soil which exceeds the established cleanup objectives.
35. If removal and off-site disposal is the remedial action chosen for any soil contamination found, then all contaminated soil which is excavated for off-site disposal must be managed as special waste in accordance with the applicable requirements of 35 IAC 722, 723, 728 and 809, as well as all applicable federal requirements.

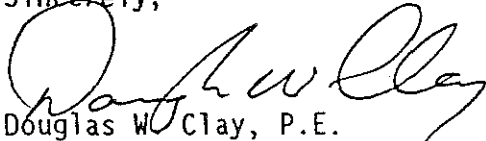
36. If removal and off-site disposal is the remedial action chosen for any soil contamination found, then soil samples must be collected for analysis from the bottom and sidewalls of the final excavation from which contaminated soil was removed. This sampling analysis effort necessary to demonstrate that the remaining soil meets the established cleanup objectives.
- a. A grid system as set forth in Section 13.b of the Agency's closure plan instructions must be established over the excavation.
  - b. Samples must be collected from the floor of the excavation at each grid intersection, including intersections along the perimeter of the excavation.
  - c. Samples must be collected 6"-12" below the ground surface at each grid intersection around the excavation perimeter. Samples must also be collected at the midpoint of the excavation wall at each grid intersection along the excavation perimeter.
  - d. Collection/analysis of all required samples must be in accordance with the procedures approved in this letter.
  - e. Soil samples which must be analyzed for volatile organic compounds shall be collected using Attachment 7 of the Agency's RCRA closure plan instructions. In addition, such samples must be collected 6"-12" beneath the floor/sidewalls of the excavation to minimize the possibility of volatilization of the contaminants prior to the collection of the samples.
  - f. No random sampling shall be conducted to verify that the cleanup objectives have been met.
37. If removal and off-site disposal is the remedial action chosen for any soil contamination found, then additional soil must be removed, as necessary, until it can be demonstrated that the remaining soil in and around the area of concern meets the established cleanup objectives. Additional samples must be collected and analyzed in accordance with Condition 7 above from areas where additional soil has been removed.
38. The Agency and Safety-Kleen have agreed that a groundwater investigation plan should not be developed by Safety-Kleen until such time that the event listed in Condition 33 occurs. Any such groundwater investigation plan should be developed in a manner similar to that required for groundwater monitoring programs set forth in 35 IAC 724, Subpart F. Guidance for the development of such a plan can be found in the USEPA documents entitled RCRA Groundwater Technical Enforcement Guidance Document and Handbook of Suggested Practices for the Installation of Groundwater Monitoring Wells.

The plan should also address the items listed in Condition 40 of the Agency's previous letter dated December 14, 1993 and the plan must be submitted for Agency review and approval prior to Safety-Kleen implementing it.

39. The attached form entitled RCRA Interim Status Closure and Post-Closure Care Plans General Form (LPC-PA18) must be completed and accompany all information submitted to the Agency associated with the closure activities described in this letter. As noted on this form, two copies must accompany the original of all submittals, so that the information submitted can be distributed, as necessary, to Agency personnel and regional offices. However, for closure activities involving land disposal units (surface impoundments, waste piles and landfills), the Agency requests that three copies be provided, as one must be forwarded to USEPA.

Should you have any questions regarding this matter, or if you have any questions while carrying out the required closure activities, please contact Gregg Sanders or Ron Hewitt at 524-3300.

Sincerely,



Douglas W. Clay, P.E.  
Hazardous Waste Branch Manager  
Permit Section, Bureau of Land

DWC:GS:sf/mls/sp121W,1-11

cc: TriHydro Corporation ✓  
USEPA Region V -- George Hamper





44-02

September 23, 1994

Mr. Gregg Sanders  
Bureau of Land--33  
Permit Section  
Illinois Environmental Protection Agency  
2200 Churchill Road  
Springfield, IL 62794-9276

RE: 1790600011 - Tazewell County, Safety-Kleen Corp. Service  
Center, RCRA Facility Closure - Extent of Degradation Inves-  
tigation; Pekin, Illinois (ILD093862811)

Dear Mr. Sanders:

Safety-Kleen Corp. (S-K) completed the field work for the extent of degradation (EOD) investigation at the Pekin facility on August 20, 1994. The EOD investigation was performed in accordance with the EOD workplan dated September 14, 1993, and conditions contained in the IEPA approval letter dated April 11, 1994. S-K received complete laboratory analytical results and QA/QC data for the EOD investigation on September 22, 1994.

As required by Condition 33 of the April 11, 1994, approval letter, S-K is hereby providing 5-day notification to IEPA that ground water was encountered during soil sampling activities prior to reaching soil which meets the concentrations in Condition 7. Mineral spirits was detected in soils immediately above the water table at concentrations exceeding the 50 mg/kg IEPA target level (Condition 7) at two of the ten soil borings used to define the extent of impacts. The two soil borings where mineral spirits concentrations exceeded the IEPA target level near the water table are located in the immediate vicinity of the former USTs. The extent of soil impacts has been defined.

Condition 33 of the April 11, 1994, approval letter also requires S-K to submit a plan to investigate potential ground-water impacts within 60 days of receipt of the analytical results from the soil sampling effort. S-K voluntarily installed and sampled three down-gradient and one up-gradient ground-water monitoring wells as part of the EOD investigation. The down-gradient monitoring wells were installed between approximately 85 and 150 feet away from the former USTs. No target/indicator constituents were detected in the August 1994 samples from the down-gradient monitoring wells; therefore, the extent of potential ground-water impacts appears to have been defined at the site.

Mr. Gregg Sanders  
September 23, 1994  
Page 2

All soil and ground-water data generated during the EOD investigation will be presented in the EOD report, which will be submitted within 90 days of receipt of the laboratory data (on or by December 21, 1994), pursuant to conditions in the April 11, 1994, approval letter. The EOD report will also include proposed plans for additional assessment activities and remedial action which will be implemented (as necessary) to achieve clean closure.

In lieu of submitting a ground-water assessment workplan within 60 days, as per Condition 33, S-K requests that the Agency review the ground-water data already collected, as well as the proposed additional assessment and remediation activities to be contained in the EOD report. Because the extent of potential ground-water impacts was defined during the EOD investigation, S-K believes that this approach will avoid unnecessary delays caused by the approval process and will keep the project moving in an efficient and timely manner.

If you have any questions concerning this submittal, please feel free to contact Jack Bedessem of TriHydro Corporation at (307) 745-7474, or me at (708) 468-2233.

Sincerely,  
SAFETY-KLEEN CORP.

*Robert A Schoepke*  
*Thomas C. Min*

Robert A. Schoepke  
Senior Project Manager - Remediation

RAS:TCN:lrb/44-02

cc: G. Long  
J. Bedessem





State of Illinois

# ENVIRONMENTAL PROTECTION AGENCY

494 corresp

Mary A. Gade, Director

2200 Churchill Road, Springfield, IL 62794-9276

217/524-3300

August 11, 1993

Safety-Kleen  
Attn: Robert Schoepke  
1000 N. Randall Road  
Elgin, Illinois 60123

Re: 1790600011 -- Tazewell County  
Safety-Kleen/Pekin  
ILD093862811  
Log No. C-531-M-4  
RCRA-Closure

Dear Mr. Schoepke:

This letter is written as a follow-up to negotiations associated with resolving the appeal of the Agency's closure plan approval letter of January 14, 1992 (Illinois Pollution Control Board (IPCB) Docket No. 92-29) which imposed additional conditions and established cleanup objectives for RCRA closure activities associated with a underground hazardous waste storage tank at the above-referenced facility (Log No. C-531-M-4). As a result of these negotiations, it was determined that establishment of facility cleanup objectives was premature at this juncture of the closure activities and that all other points of appeal had been resolved by mutual agreement. Specifically, it was determined that the facility cleanup objectives (CUOs) for this closure should not be established until: (1) the horizontal and vertical extent of contaminated soils in the vicinity of the hazardous waste management units is delineated, and (2) Safety-Kleen is able, if desired, to develop site specific, risk-based cleanup objectives subject to Agency review and approval. As a result, this letter is written to document the closure procedures agreed upon during the appeal negotiations and to supersede the Agency's January 14, 1992 closure plan approval letter.

The closure plan modification request for an underground hazardous waste tank (S02) at the above referenced facility, submitted by Safety-Kleen and prepared by TriHydro Corporation, has been reviewed by this Agency. The closure plan modification, entitled "Partial Closure Progress Report -- Safety-Kleen Corporation Service Center -- Pekin, Illinois," is hereby approved subject to the following conditions and modifications:

1. The provisions of this letter shall only become effective upon Safety-Kleen's withdrawal and the IPCB's subsequent dismissal of the above-referenced permit appeal.

2. This letter supersedes the January 14, 1992 closure plan approval letter which established cleanup objectives and imposed additional conditions for the subject closure activity.
3. When closure is complete, the owner or operator must submit to the Agency certification both by the owner or operator and by an independent registered professional engineer that the facility has been closed in accordance with the specifications in the approved closure plan.

The attached closure certification form must be used. Signatures must meet the requirements of 35 Ill. Adm. Code Section 702.126. The independent engineer should be present at all critical, major points (activities) during the closure. These might include soil sampling, soil removal, backfilling, final cover placement, etc. The frequency of inspections by the independent engineer must be sufficient to determine the adequacy of each critical activity. Financial assurance must be maintained for the units approved for closure herein until the Agency approves the facility's closure certification.

The Illinois Professional Engineering Act (Ill. Rev. Stat., Ch. 111, par. 5101 et. seq.) requires that any person who practices professional engineering in the State of Illinois or implies that he (she) is a professional engineer must be registered under the Illinois Professional Engineering Act (par. 5101, Sec. 1). Therefore, any certification or engineering services which are performed for a closure plan in the State of Illinois must be done by an Illinois P.E.

Plans and specifications, designs, drawings, reports, and other documents rendered as professional engineering services, and revisions of the above must be sealed and signed by a professional engineer in accordance with par. 5119, sec. 13.1 of the Illinois Professional Engineering Act.

As part of the closure certification, to document the closure activities at your facility, please submit a Closure Documentation Report which includes:

- a. The volume of waste and waste residue removed. The term waste includes wastes resulting from decontamination activities.
- b. A description of the method of waste handling and transport.
- c. The waste manifest numbers.
- d. Copies of the waste manifests.
- e. A description of the sampling and analytical methods used including sample preservation methods and chain-of-custody information.

- f. A chronological summary of closure activities and the cost involved.
- g. Color photo documentation of closure. Document conditions before, during and after closure.
- h. Tests performed, methods and results.

The original and two (2) copies of all certifications, logs, or reports which are required to be submitted to the Agency by the facility should be mailed to the following address:

Illinois Environmental Protection Agency  
Bureau of Land -- #33  
Permit Section  
2200 Churchill Road  
Post Office Box 19276  
Springfield, Illinois 62794-9276

- 4. If the Agency determines that implementation of this closure plan fails to satisfy the requirements of 35 Ill. Adm. Code, Section 725.211, the Agency reserves the right to amend the closure plan. Revisions of closure plans are subject to the appeal provisions of Section 40 of the Illinois Environmental Protection Act.
- 5. By September 15, 1993, Safety-Kleen shall submit to the Agency for review and approval the following in the form of a report (Note: Safety-Kleen should take into account the comments provided by the Agency in its May 18, 1992 letter when developing this report).
  - a. Information regarding the geology and hydrogeology of the site which addresses the various items in the attached document entitled Guidance for Establishing the Basis for Cleanup Objectives:
  - b. A list of the constituents which appropriate soil and groundwater samples will be analyzed for in the future and the analytical methods which will be used as part of RCRA closure activities. Justification for not including any constituent identified in Condition 5.d below must also be provided.

In addition, to address the deficiencies noted in Conditions 9 and 10 of the Agency's January 14, 1992 closure plan approval letter, all soil samples should be analyzed using Methods 8240 and 8270 in SW-846 for all constituents identified in the Practical Quantitation Limits table associated with the respective method. This additional analytical requirement will not be necessary if Safety Kleen provides additional information to address the deficiencies noted in Condition 9 and 10k of the Agency's January 14, 1992 letter. This additional information may include documentation that it was physically impossible to use Attachment 7 sampling produces, but that an effort was made to minimize volatilization of any contaminants during sample collection.

- c. A plan for establishing, as necessary, background concentrations of any constituent of concern. This plan must include:
1. A scaled drawing showing each soil sampling location. Samples must be collected from areas unaffected by facility operations;
  2. The depth from which the samples will be collected;
  3. The procedures which will be used to collect the samples;
  4. The parameters which will be analyzed for and the analytical methods to be used;
  5. The statistical method to be used in evaluating the data. An acceptable method can be found in Chapter 9, Table 9-1, Equation 6 of SW-846.
- d. A detailed plan for determining the horizontal and vertical extent of soil and/or groundwater which contains constituents in concentrations higher than those in the table below which are also the constituents developed pursuant to paragraph 5.b herein above.

<u>Contaminant</u>	<u>Soil Concentration (mg/kg)(1)</u>	<u>Groundwater Concentration (mg/l)(1)</u>
<u>Inorganics</u>		
Arsenic	0.05*	0.05
Cadmium	0.005*	0.005
Chromium	0.1*	0.1
Lead	0.0075*	0.0075
<u>Organics</u>		
Acetone	0.7	0.7
Bis(2-ethyl-hexyl)phthalate	0.33	0.01
Di-n-butyl-phthalate	14.0	0.7
Ethylbenzene	0.7	0.7
Isophorone	1.4	1.4
Methylene Chloride	0.005	0.005
Mineral Spirits	50.0	0.5
Xylenes	10.0	10.00

\* Value is based on the analysis of the extract of the TCLP test (Method 1311 in SW-846). Thus the actual unit of measure for these values in the table above in mg/l.

- (1) These concentrations may be adjusted if Safety-Kleen provides information in any report documenting the results of any sampling/analysis effort that the levels could not be achieved using standard laboratory practice.

6. The plan required by Condition 5.d above as it relates to a soil investigation should be developed in general accordance with Sections 13.a and 13.b of the Agency's closure plan instructions (revised December 19, 1990). However, no random sampling shall be used in this investigation.
7. The plan required by Condition 5.d above as it relates to a groundwater investigation should be developed in general accordance with the USEPA documents entitled a RCRA Groundwater Technical Enforcement Guidance Document and Handbook of Suggested Practices for the Installation of Groundwater Monitoring Wells. In addition, this report may also contain the information necessary to determine the appropriate classification of the groundwater beneath the site, as set forth in 35 IAC 620. This report must also contain information related to the establishment of a groundwater management zone at the facility, if necessary.
8. Within 90 days after the receipt of results from implementation of the plan submitted to and approved by Agency pursuant to Conditions 5 through 7 above, Safety-Kleen, shall submit those results to the Agency for review and approval. In addition, this submittal may propose site-specific soil cleanup objectives Safety-Kleen feels are necessary along with the bases for those proposed objectives. These objectives must meet the closure performance standards of 35 IAC 725.211, 725.214 and 725.297. Guidance for the development of site-specific cleanup objectives is attached. It must be noted that use of the TCLP test in establishing cleanup objectives for volatile organic compounds in soil may not be acceptable, as no information has yet been provided demonstrating that this procedure would meet the aforementioned closure performance standards.
9. All necessary cleanup objectives for groundwater must meet the requirements of 35 IAC 620, including the procedures set forth in 35 IAC 620, Subpart F for establishing objectives for constituents which do not have standards. A groundwater management zone meeting the requirements of 35 IAC 620 must be established, as necessary.
10. Safety-Kleen shall submit a separate report describing any necessary and appropriate proposed remedial measures to meet the site-specific cleanup objectives once the work required by Conditions 5 through 7 above have been completed. This report must be submitted within 90 days of receipt of the results from implementation of the plan under Conditions 5 through 7 above, or if Safety-Kleen proposes site-specific levels in accordance with Condition 8 above, within 60 days of receipt of Agency-approved site-specific cleanup levels. This plan must describe in detail the proposed remediation activities and it must include scaled drawings, design specifications, supporting calculations, etc. as necessary to

support the proposed remediation effort. Additional guidance regarding the type of information which must be contained in this plan will be provided to Safety-Kleen when the Agency approves the information identified in Condition 5 above.

11. Should Safety-Kleen determine that clean closure cannot be achieved, then a plan must be submitted to the Agency describing in detail the procedures which will be utilized to close the units as landfills and provide post closure care of such units. Such a plan must contain detailed cost estimates and the financial assurance documents on file with the Agency must also be revised, as necessary, to reflect the revised cost estimates.
12. A conceptual contingent closure/post-closure care plan for closing the subject units as landfills must be submitted to the Agency for review and approval within 90 days after receipt of this letter by Safety-Kleen. It should be submitted along with the report required by Condition 5 above. This plan must describe qualitatively the procedures which would be used to close the units as landfills and provide the associated post-closure care in accordance with 35 Ill. Adm. Code 725.297(b), 725.410 and 725, Subpart G, if they cannot be clean-closed.
13. The plan required by Condition 12 above must also contain cost estimates for the various activities described in the conceptual plan. All data and calculations used in preparing the cost estimates must be included in the plan. This data must include such items as unit cost, hours and rates for labor, analytical cost per sample, number of samples, equipment cost, material cost and amounts, etc. Justification must be provided for all data utilized in developing the estimates. The cost estimates must be based upon third party costs.
14. Once the cost estimates identified in Condition 13 are approved, financial assurance meeting the requirements of 35 IAC 725, Subpart H must be established to cover these estimated costs.
15. A request for release of financial assurance documents should be included with the closure certification documents.
16. Under the provisions of 29 CFR 1910 (51 FR 15,654, December 19, 1986), cleanup operations must meet the applicable requirements of OSHA's Hazardous Waste Operations and Emergency Response standard. These requirements include hazard communication, medical surveillance, health and safety programs, air monitoring, decontamination and training. General site workers engaged in activities that expose or potentially expose them to hazardous substances must receive a minimum of 40 hours of safety and health training off site plus a minimum of three days of actual

field experience under the direct supervision of a trained experienced supervisor. Managers and supervisors at the cleanup site must have at least an additional eight hours of specialized training on managing hazardous waste operations.

17. 35 IAC 721.131 F001 through F005 wastes must be disposed in accordance with 35 IAC Part 728.
18. To avoid creating another regulated storage unit during closure, it is recommended that you obtain any necessary permits for waste disposal prior to initiating excavation activities. If it is necessary to store excavated hazardous waste on-site prior to off-site disposal, do so only in containers or tanks for less than ninety (90) days. Do not create regulated waste pile units by storing the excavated hazardous waste in piles. The ninety (90) day accumulation time exemption (35 IAC 722.134) only applies to containers and tanks.
19. Please be advised that the requirements of the Responsible Property Transfer Act (Public Act 85-1228) may apply to your facility due to the management of RCRA hazardous waste. In addition, please be advised that if you store or treat on-site generated hazardous waste in containers or tanks pursuant to 35 IAC 722.134, those units are subject to the closure requirements identified in 35 IAC 722.134(a)(1).
20. All hazardous wastes that result from this project are subject to annual reporting as required in 35 IAC 722.141 and shall be reported to the Agency by March 1 of the following year for wastes treated and left on-site or shipped off-site for storage, treatment and/or disposal during any calendar year. Additional information and appropriate report forms may be obtained from the Agency by contacting:

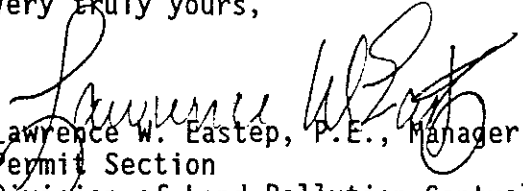
Facility Reporting Unit  
Bureau of Land  
Illinois Environmental Protection Agency  
2200 Churchill Road  
P.O. Box 19276  
Springfield, Illinois 62794-9276

21. This letter has been modified to reflect the fact that only one hazardous waste tank was actually removed during the closure activities associated with Log No. C-531. This information was provided to the Agency in a letter dated July 1, 1993 from Ms. Barbara A. Magel, Karaganis & White, Ltd.

Safety-Kleen/Pekin (C-531-M-4)  
Page 8

Should you have any questions regarding this matter, please contact Jim Moore at 524-3300.

Very truly yours,

  
Lawrence W. Eastep, P.E., Manager  
Permit Section  
Division of Land Pollution Control  
Bureau of Land

LWE:JM/mls/sp541Y/1-8  
JKH

Attachments: Closure Certification Statement  
Guidance on the Required Information for Site-Specific Soil Cleanup Objectives  
Guidance for Establishing the Basis for Cleanup Objectives  
Guidance for Developing a Risk Assessment for Site-specific Soil Cleanup Level Proposal for RCRA Clean Closures

cc: TriHydro Corporation ✓  
USEPA Region V -- George Hamper



ATTACHMENT

This statement is to be completed by both the responsible officer and by the registered professional engineer upon completion of closure. Submit one copy of the certification with original signatures and three additional copies.

Closure Certification Statement

Closure Log C-531-M-4

The hazardous waste storage tank (S02) at the facility described in this document has been closed in accordance with the specifications in the approved closure plan. I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

\_\_\_\_\_  
USEPA ID Number

\_\_\_\_\_  
Facility Name

\_\_\_\_\_  
Signature of Owner/Operator      Date

\_\_\_\_\_  
Name and Title

\_\_\_\_\_  
Signature of Registered P.E.      Date

\_\_\_\_\_  
Name of Registered P.E.  
and Illinois Registration  
Number

P.E. Mailing Address:

Registered P.E.'s Seal:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

GUIDANCE ON THE INFORMATION WHICH SHOULD BE PROVIDED FOR  
SITE-SPECIFIC SOIL CLEANUP OBJECTIVES  
FOR RCRA CLEAN CLOSURES  
(July 1993)

The IEPA allows facilities to propose site-specific soil cleanup objectives (CUOs) and will accept them as meeting the RCRA closure performance standards of 35 IAC 725, Subpart G if the facility submits sufficient information to the Agency demonstrating that the proposed levels will not (1) potentially result in significant contamination of any environmental media, and (2) result in a present or future threat to human health or the environment due to direct contact through dermal exposure, inhalation or ingestion.

Information pertaining to the existing conditions at the site should be gathered before a detailed risk assessment can be made which demonstrates that the proposed soil CUOs meet the objectives stated above. Therefore, the following steps should be taken in the development of site-specific soil CUOs.

1. Prior to initiating any site-specific evaluation of the risks associated with any residual contamination that will remain at the site, information should be provided to the Agency regarding the horizontal and vertical extent of soil at the site in which contamination exists at levels greater than IEPA established CUOs. This information should not only include the extent of contamination, but it should also identify the distribution of the contaminants within these boundaries. With this information in hand, a facility can begin to evaluate the overall impacts which may result from leaving certain levels of residual contamination in the soil. The information which should be provided includes:
  - a. A report documenting the horizontal and vertical extent of contamination above IEPA established CUOs. This report should include results of analyses conducted to date and any other sampling/analysis effort necessary to determine the horizontal and vertical extent of contamination. This report should include:
    1. A summary of the results (including tables);
    2. A scaled drawing showing the location where all soil samples were collected, relative to the regulated unit;
    3. The depth interval where the samples were collected;
    4. A description of the soil sampling procedures, sample preservation procedures and chain of custody procedures;
    5. Identification of the test method used and detection limits achieved;
    6. Copies of the final laboratory report sheets;

7. Scaled drawings (plan view and cross-sections) showing (1) the boundaries of the soil which contains contaminants above the IEPA established CUOs and (2) the distribution of the contamination (including actual concentrations) within these boundaries.
  8. An identification and discussion of localized areas where contaminant concentrations are much higher than in the rest of the area of concern (i.e., "hot spots"). Such areas should be identified in the drawings and thoroughly discussed.
  9. A calculated estimate of the mass of contaminants present in the area of concern.
  10. An identification and discussion of the areas where 50%, 75%, 90%, 95% and 99% of the contamination is present, if such information would help to evaluate and understand the contaminant distribution in the area of concern. Such areas should be identified in the drawings and thoroughly discussed.
  11. A discussion of the information identified above. This discussion should include a description of the amount of contamination present at the area in comparison to the IEPA established CUOs. This description must focus on both (1) the horizontal and vertical extent of contamination and (2) the distribution of the contamination (including actual concentration) within these boundaries.
- b. A report describing any activities conducted to date regarding any soil removal activities. The information in this report should include:
1. Scaled drawings showing the horizontal and vertical boundaries of the final excavation from which any soil was removed;
  2. Sampling/analytical results which indicate the concentration of contaminants remaining in the bottom and sidewalls of the excavations;
  3. Appropriate information identified in Item 1.a. above as it relates to the sampling and analysis done in connection with any soil removal activities.
2. In conjunction with the requirements of Item 1 above, information related to the geology/hydrogeology of the site should also be provided to the Agency, including an identification of the presence and use of aquifers beneath the site. Agency guidance for gathering and reporting this information, entitled Guidance for Establishing the Basis for Cleanup Objectives.

3. Once the information required by Items 1 and 2 above is obtained, a detailed site-specific assessment should be made which conclusively demonstrates that the proposed residual soil contamination at this site does not pose a risk to human health and the environment. Guidance for conducting a site specific risk assessment can be obtained from the documents outlined in the draft Agency document entitled Guidance for Developing Risk Assessment for a Site-Specific Soil Cleanup Level Proposal for RCRA Clean Closures. This document discusses the information which should be included in, and format of, a site specific risk assessment.
  - a. The efforts associated with the risk assessment include making several assumptions, some of which may or may not be entirely representative of what will actually happen. Therefore, factors of safety must also be utilized to offset these assumptions. Furthermore, factors of safety must also be utilized to further ensure that the proposed cleanup objectives will indeed be protective of human health and the environment. It should be noted that factors of safety are commonplace in engineering design where uncertainties exist and where the final design must be protective of human health. As such, results of any analytical effort should be reduced by an appropriate factor of safety to ensure the proposed soil objectives are truly protective of human health and the environment.
  - b. An evaluation should also be conducted on the impacts the proposed residual soil contamination will have, if any, on the groundwater beneath the facility. No proposed residual soil concentration may cause the groundwater quality beneath the facility to exceed the groundwater standards set forth in 35 IAC 620.

(July 1993)

JM/mls/sp380Z/1-3

GUIDANCE FOR ESTABLISHING THE BASIS FOR CLEANUP OBJECTIVES  
(December 1992)

The Illinois Pollution Control Board finalized regulations establishing groundwater quality standards for the State of Illinois (see 35 IAC 620) in November 1991. As such, the Agency must ensure that the soil cleanup objectives which have been or will be established for each facility will not cause any future violations of these standards. In general, the Agency will establish soil and groundwater cleanup objectives which it feels are necessary to protect the quality of Class I groundwater (the most stringent standards), unless site-specific information is provided which would indicate otherwise. Therefore, if a facility desires to have less stringent cleanup objectives than those based upon the protection of Class I groundwater, a report must be developed and submitted to the Agency which (1) assesses the geology and hydrogeology of this site and (2) indicates no groundwater subject to the Class I standards will be impacted by the residual contamination in the soil. Such a determination will result in the Agency establishing cleanup objectives based upon the protection of Class II groundwater. This report should utilize, as available, existing information and contain:

1. A detailed description of the geologic and hydrogeologic characteristics of the area in which the site is located. Specifically, the geography, geology, lithology, stratigraphy and hydrogeology of the area within a 1 to 2 mile radius of the site based upon existing information must be described. In addition, the presence and location of any "Class I aquifers" (as generally defined in 35 IAC 620) must be identified and discussed. Existing information which should be relied upon includes, but is not limited to, information from the Illinois Scientific Surveys, the Agency, other State and Federal organizations, water well investigation logs and previous investigations (including subsurface investigations for building foundations). References should be provided in the report for all sources of information utilized in the report.
2. The results of a site specific investigation which included, at a minimum, one boring made near the area undergoing closure which was (1) drilled in accordance with ASTM Method D-420 and (2) sampled continuously using either a split spoon sampler (ASTM Method D-1586) or a Shelby tube sampler (ASTM Method D-1587). In addition, all soil encountered must be field classified in accordance with ASTM Method D-2488. Furthermore, appropriate testing must be conducted, as necessary, to demonstrate that the water-bearing units encountered do not possess any of the characteristics identified in 35 IAC 620.210(a)(4). This boring must extend from the ground surface to a depth which is 10' into the uppermost water-bearing unit subject to Class I standards OR bedrock, whichever is shallower. The information related to this investigation contained in the report must include:
  - a. A discussion of the procedures utilized;
  - b. A completed boring log;
  - c. The results of all tests conducted during the investigation;

GUIDANCE FOR ESTABLISHING THE  
BASIS FOR CLEANUP OBJECTIVES  
Page 2

- d. Identification of all unconsolidated geologic units beneath the site, to bedrock;
  - e. Identification of those geologic units in Item 1.d above which are water-bearing units and an indication of whether the groundwater in these units would be subject to the Class I or Class II standards set forth in 35 IAC 620;
  - f. A discussion of the results, including a conclusion related to the presence or absence beneath the site of groundwater subject to the Class I standards.
3. An identification of any private water supply wells within a one mile radius of the site. A scaled drawing showing the location of these wells must be provided along with actual logs and documentation of the efforts made to obtain this information;
  4. An identification of any public water supply wells within a two mile radius of the site. A scaled drawing showing the location of these wells must be provided along with actual logs and documentation of the efforts made to obtain this information;
  5. An identification of the geologic units beneath the site which are used for private water supply within a one mile radius of the site (including bedrock units) and an indication of whether these units contain groundwater subject to the Class I Standards;
  6. An identification of the geologic units beneath the site which are used as a public water supply (including bedrock units) and an indication of whether these units contain groundwater subject to the Class I standards;
  7. A discussion of the impact the residual soil contamination at the site will have on any groundwater beneath the site which is subject to the Class I standards.

The Illinois State Water Survey and the Illinois State Geological Survey should be contacted, as well as other appropriate state and federal entities, to obtain existing information related to the hydrogeology of the area. The report must contain adequate documentation that information from the surveys was used in developing this hydrogeologic assessment.

A certification meeting the requirements of 35 IAC 702.126 must accompany this report. In addition, an independent Illinois registered professional engineer must also certify the information in the report.

(December, 1992)

JM:sf/sp/458Z,1-2

GUIDANCE FOR DEVELOPING A RISK  
ASSESSMENT FOR A SITE-SPECIFIC SOIL CLEANUP  
LEVEL PROPOSAL FOR RCRA CLEAN CLOSURES  
(Revised April 1993)

Clean closure of a hazardous waste management unit requires removal of all waste, leachate, liners, soil and groundwater which are contaminated with waste or leachate that pose a present or potential threat to human health or the environment. USEPA put this requirement in simpler terms by stating that the ultimate goal of clean closure is "drinkable leachate" and "edible soil" (see 53 FR 51446, December 21, 1988). As such, all soil which remains at a site undergoing clean-closure must meet certain cleanup objectives (CUOs) which will ensure that this ultimate goal is met. The Agency generally establishes "base line" cleanup objectives for facilities utilizing very conservative assumptions, due to the large number of RCRA closures being carried out in the State of Illinois. However, a facility may propose site-specific health-based (human and environmental) levels to the Agency for review and approval which would be utilized to ensure that the soil remaining at that site would not pose a present or potential threat to human health or the environment. Thus, this document, and the document entitled Guidance on the Required Information for Site-Specific Soil Cleanup Objectives, have been developed to provide guidance regarding the information which should be provided to the Agency in support of any such proposal.

The site-specific soil CUOs proposed by a facility must be such that the levels of contaminants which remain in the soil will not (1) potentially result in significant contamination of any environmental media (groundwater, soil, surface water or air), and (2) result in a present or future threat to human health or the environment due to direct contact through dermal exposure, inhalation or ingestion. These proposed levels must be based on a detailed assessment of the risks associated with leaving the proposed levels of contaminants in the soil. Guidance regarding the procedures which should be utilized in developing these proposed cleanup objectives can be found in, but not limited to, the following:

1. "Risk Assessment Guidance for Superfund, Volume I; Human Health Evaluation Manual" (EPA /540/1-89/002, December, 1989)
2. "Risk Assessment Guidance for Superfund: Volume I - Part B, Development of Risk-Based Preliminary Remediation Goals" (Pub. 9285.7-01B, December, 1991)
3. "Human Health Evaluation Manual Supplemental Guidance: Standard Default Exposure Factors" (Pub. 9285.6-03, March, 1991)
4. "Superfund Exposure Assessment Manual" (EPA/540/1-88/001, April, 1988)
5. "Dermal Exposure Assessment: Principles and Applications: (EPA/600/8-91/011B, January, 1992)
6. "Exposure Factors Handbook" (EPA/600/8-89/043, July, 1989)

7. "Summary Report on Issues in Ecological Risk Assessments" (EPA/625/3-91/018, February, 1991)
8. "Ecological Assessment of Hazardous Waste Sites: A Field and Lab Reference" (EPA/600/3-89/013, March, 1989)
9. "Risk Assessment Guidance for Superfund, Volume II: Environmental Evaluation Manual (Interim Final)" (EPA/540/1-89/001, March, 1989)
10. 35 Illinois Administrative Code, Part 620, Subpart F: Health Advisories
11. 35 Illinois Administrative Code, Part 724, Subpart F: Releases From Solid Waste Management Units
12. Integrated Risk Information System (IRIS)
13. Health Effects Assessment Summary Tables (HEAST)

At a minimum, these proposed cleanup objectives must be based upon an evaluation of the impacts such residual soil contamination will have on: (1) surface water contact and ingestion by humans and wildlife, (2) groundwater contact and ingestion by humans, (3) soil ingestion by humans and wildlife, (4) dermal contact by humans and wildlife, (5) inhalation of vapors by humans and wildlife and (6) the quality of local surface water and groundwater in comparison to established standards. Keep in mind that the potential point of exposure to hazardous waste constituents for clean closure must be assumed to be directly at or within the boundary of the unit for all routes of exposure (surface water contact, groundwater ingestion, inhalation and direct contact). No attenuation of the hazardous waste constituents leaching from the waste residues can be presumed to occur before the constituents reach exposure points. The use of fate and transport modeling to determine exposure levels outside the area of contamination will not be accepted. Levels of constituents in leachate may be estimated based on known characteristics of the waste constituents determined by soil leaching tests (e.g. TCLP).

A report documenting all efforts carried out as part of this assessment must be submitted to the Agency for review and approval along with the proposed cleanup objectives. This report must support the cleanup objectives being proposed and include the following:

1. A discussion of the procedures (and models) utilized for the assessment, including specific references to the source of the procedures and models used. This discussion should address the following components of each exposure scenario (i.e., dermal contact, inhalation of vapors, ingestion of soil/groundwater, etc.) developed for the risk assessment:
  - a. the source of the hazard (i.e., contaminated soil, groundwater, etc.);
  - b. potential target receptors (i.e., human, plant, animal, etc.) with an explanation as to why they were selected; and



- c. potential exposure circumstances (i.e., occupational, residential, etc.) with a discussion on the future land use of this site. Currently, the Agency requires that a residential setting be evaluated, rather than occupational/industrial;
2. Justification for the procedures and models utilized;
3. A discussion of the strengths and weaknesses of the procedures (and models) utilized for the assessment;
4. A discussion of all assumptions made and the effects they have on the overall effort;
5. Justification, including specific references, of all assumptions used in the evaluation;
6. Appropriate reference to information obtained from textbooks, reference books, guidance documents, etc. This reference should identify the exact page(s) within the document from which the information was obtained;
7. A discussion and justification of all data utilized for the assessment. Please note that the data relating to the physical and chemical characteristics of the site (e.g., site geology and extent of contamination) must be site-specific. Approximate values for the various parameters used in the assessment, that are based upon general textbook ranges, will not be accepted.
8. A sensitivity analysis for all input parameters whose value is somewhat uncertain.
9. All documentation supporting the site-specific data utilized using the assessment. This would include, but not be limited to, the following items:
  - a. a discussion of the hydrogeology at these site (i.e, depth to bedrock aquifer classification, soils classification, etc.) and the results of the geological borings;
  - b. a discussion of the results of the soil analyses;
  - c. copies of the analytical reports from the laboratory;
  - d. the test methods used and detection limits achieved;
  - e. the depth and interval of samples taken;
  - f. a scaled drawing showing the location of the subject hazardous waste management unit(s) and the locations where the soil samples were obtained;

- g. a description of the soil sampling procedures and sample preservation/chain of custody methods.
10. All calculations required as part of the assessment;
11. A discussion of the results. This discussion should, among other things, put into perspective the results based upon the assumptions utilized and the methods employed during the assessment. It should focus on the actual effects which may occur if the proposed level of contaminants are allowed to remain at the facility. It should also describe the uncertainties in the assessment and possibly include a range of plausible risks up to and including the risks which might be experienced by the maximally exposed individual in the present and future.
12. Certification in accordance with 35 IAC 702.126 by a registered professional engineer that all calculations made in this evaluation are correct. This certification is not meant to indicate that the methods used are correct only that the arithmetic manipulation of the data (addition, subtraction, multiplication and division) is correct.

Soil cleanup levels will depend to a great extent on the existing and potential use of groundwater and/or surface water in the area surrounding the facility. Information and documentation regarding existing and potential use of groundwater and/or surface water in the area surrounding the facility should be provided to justify a proposed site-specific, health-based cleanup level. More specifically, the owner/operator should contact the IEPA Division of Public Water Supplies (DPWS) at 217/785-8653; Illinois Department of Public Health (Springfield) at 217/782-5830; the Illinois State Water Survey (Champaign) at 217/333-8497; and the Illinois State Geological Survey (Champaign) at 217/333-4747 to gather information to determine the existing and potential type and extent of groundwater and/or surface water use in the area.

The Agency cannot guarantee that the cleanup levels derived from the risk assessments will be the final objectives approved by the Agency for this site. The Agency must be satisfied that (1) any soil contamination remaining on-site cannot cause degradation of groundwater or surface water and will not become an air pollution source; and (2) any contamination remaining in the groundwater will not pose a current or potential threat to human health and the environment.

Specific questions regarding the development of site-specific soil cleanup objectives should be directed to the Office of Chemical Safety of this Agency (Telephone No. 217/785-0830).

JM/mls/sp97Z/1-4

(April 1993)

APPENDIX B

PHOTODOCUMENTATION  
EXTENT OF DEGRADATION INVESTIGATION  
SAFETY-KLEEN CORP. SERVICE CENTER  
PEKIN, ILLINOIS





APPENDIX B  
PHOTODOCUMENTATION  
EOD INVESTIGATION  
SAFETY-KLEEN CORP. SERVICE CENTER  
PEKIN, ILLINOIS

<u>Photo</u>	<u>Description</u>
1.	View northeast showing drilling and sampling at borehole EOD-3. IEPA personnel (Gregg Sanders and Ron Maholic) and S-K personnel (Bob Schoepke) in background.
2.	Split sample collected from Borehole EOD-3 collected by IEPA.
3.	View southwest showing drilling and sampling at Borehole EOD-5. Concrete slab overlying former USTs excavation in foreground. Note concrete dust at borehole locations EOD-1, EOD-2, and EOD-4 (completed) and orange paint mark at borehole location EOD-3 in foreground (not yet drilled).
4.	Preparing soil samples for volatile organics analysis (applying Teflon sheeting and tight-fitting plastic caps to brass rings).
5.	Preparing soil samples for metals analysis (filling glass jars) following field screening sample in plastic bag for TOV with PID.
6.	View west showing retrieval of continuous core sample at Wellbore MW-2A.
7.	View northwest showing installation of well screen and casing at Well MW-5.
8.	Installation of sand filter pack at Well MW-5.





1



3



2



4



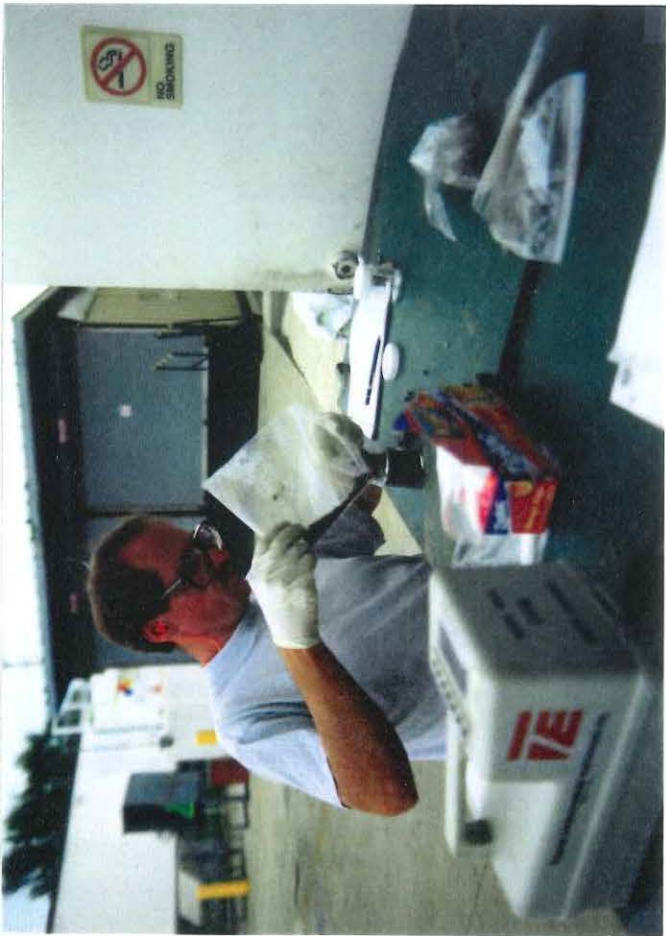




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8



5



9





APPENDIX C

LOG-OF-BOREHOLE FORMS  
WELL COMPLETION REPORTS  
AND IDPH WELL CONSTRUCTION REPORTS  
EXTENT OF DEGRADATION INVESTIGATION  
SAFETY-KLEEN CORP. SERVICE CENTER  
PEKIN, ILLINOIS

- C-1 LOG-OF-BOREHOLE FORMS FOR SOIL BORINGS
- C-2 LOG-OF-BOREHOLE FORMS FOR MONITORING WELLS
- C-3 WELL COMPLETION REPORTS
- C-4 IDPH WELL CONSTRUCTION REPORTS











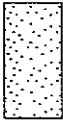
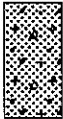
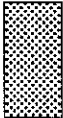



APPENDIX C-1

LOG-OF-BOREHOLE FORMS FOR SOIL BORINGS



# FIELD BORING LOG EXPLANATION

LITHOLOGY		SAMPLE TYPE
	CLAY (CL)	 SPLIT SPOON
	SILT LOAM (OL/ML)	
	SANDY, SILTY CLAY (SC/SM)	 CONCRETE
	SILT (ML)	 HOLLOW TUBE/ BRASS RING
	SILTY SAND (SM)	
	SAND (SP)	
	SILTY GRAVEL (SM/GM)	
	WELL GRADED SAND (SW)	
	SAND AND GRAVEL (SW/GW)	







# Illinois Environmental Protection Agency

## Field Boring Log

Page 1 of 2

Site File No. 1790600011 County Tazewell

Boring No. EOD-1 Monitor Well No. NA

Site File Name Safety-Kleen Corp., Pekin Service Center, Pekin, IL

Surface Elev. 495.0 Completion Depth 16.0

ID. No. ILD-093-862-811

Auger Depth 16.0' Rotary Depth NA

Quadrangle Pekin, II Sec. 15 T. 24 N R. 5 E

Date: Start 8/9/94 Finish 8/9/94



UTM Coord. N. 4489750.00 E. 274500.00

Boring Location NE boring in tank excavation area.

Drilling Equipment Scorpion Hyd. Probe

Elev.	DESCRIPTION	Graphic Log	Depth in feet	SAMPLES						Personnel	
				Sample No.	Sample Type	Sample Recovery (%)	Pocket Penetrometer (tsf)	N Values (Blows)	OVA or PID readings (ppm)	G - T. Nissen	D - Mark Yiatras
										H - Steve Grace	H - C. DeWolf
										REMARKS	
	0-0.5 Concrete									Begin drilling through concrete.	
494.0	0.5-4.0 SAND (SP), medium grained, tan with <5% lithic fragments. Quartz 80 + %. Clean, no silt. Excavation fill.		1			75			0		
493.0			2								
492.0			3							No samples collected in excavation fill, field screen continuously.	
491.0	4.0-6.0 SAND (SP), as above.		4			75			0		
490.0			5								
489.0	6.0-8.0 SAND (SP), as above with minor silt and occasional silt/clay mixed in - still in excavation.		6			50			1.8		
488.0			7								
487.0	8.0-10.0 SAND (SP), as above, still looks like excavation.		8			91			0		
486.0			9							Tank invert sample, 2 brass rings, 1 jar metals.	
485.0	10.0-12.0 SAND (SW), coarse with minor gravel sized fragments, brown lithic fragments approximately 20%. More feldspar, less quartz than above.		10			75			0		
484.0			11								
483.0	12.0-14.0 SAND (SW), coarse as above.		12			75			0		
482.0			13								
481.0	14.0-16.0 SAND (SW), coarse, as above. Abundant lithic fragments.		14			75			0		
480.0			15								

Site File No. 1790600011County TazewellBoring No. EOD-1Monitor Well No. NA

Elev.	DESCRIPTION	Graphic Log	Depth in feet	SAMPLES						Personnel	
				Sample No.	Sample Type	Sample Recovery (%)	Pocket Penetrometer (tsf)	N Values (Blows)	OVA or PID readings (ppm)	REMARKS	
479.0			16								Offset 4" N, second hole for duplicate for IEPA. Duplicate collected, 2 brass rings TD = 16.0



## Illinois Environmental Protection Agency

## Field Boring Log

Page 1 of 1Site File No. 1790600011 County Tazewell Boring No. EOD-2 Monitor Well No. NAFile Name Safety-Kleen Corp., Pekin Service Center, Pekin, IL Surface Elev. 495.0 Completion Depth 9.5ID. No. ILD-093-862-811 Auger Depth 9.5' Rotary Depth NAQuadrangle Pekin, IL Sec. 15 T. 24 N R. 5 E Date: Start 8/9/94 Finish 8/9/94UTM Coord. N. 4489750.00 E. 274500.00Boring Location NW boring in tank excavation area.Drilling Equipment Scorpion Hyd. Probe

Elev.	DESCRIPTION	Graphic Log	Depth in feet	SAMPLES							Personnel	
				Sample No.	Sample Type	Sample Recovery (%)	Pocket Penetrometer (tsf)	N Values (Blows)	OVA or PID readings (ppm)		G - Tom Nissen	D - Mark Yiatras
											H - Steve Grace	H - C. DeWolf
											REMARKS	
	0-0.5 Concrete											
494.0	0.5-10.0 Drilled blind through fill. Refusal.		1									
493.0			2									
492.0			3									
491.0			4									
490.0			5									
489.0			6									
488.0			7									
487.0			8									
486.0			9									
											Refusal at 9.5' concrete	
											Begin drilling again offset 1' to E, 2nd refusal at same depth.	
											Third refusal at same depth, abandon location	
											No sample collected.	
											TD = 9.5	



## Illinois Environmental Protection Agency

## Field Boring Log

Page 1 of 3Site File No. 1790600011 County TazewellBoring No. EOD-2A Monitor Well No. NASite File Name Safety-Kleen Corp., Pekin Service Center, Pekin, ILSurface Elev. 495.0 Completion Depth 36.0Fed. ID. No. ILD-093-862-811Auger Depth 36.0' Rotary Depth NAQuadrangle Pekin, II Sec. 15 T. 24 N R. 5 EDate: Start 8/12/94 Finish 8/12/94UTM Coord. N. 4489750.00 E. 274500.00Boring Location Approximately 15' NW of EOD-2.Drilling Equipment Scorpion Hyd. Probe

Elev.	DESCRIPTION	Graphic Log	Depth in feet	SAMPLES						Personnel	REMARKS
				Sample No.	Sample Type	Sample Recovery (%)	Pocket Penetrometer (tsf)	N Values (Blows)	OVA or PID readings (ppm)	G - Tom Nissen D - Mark Yiatras H - Steve Grace H - C. DeWolf	
	0-0.5 Concrete										
494.0	0.5-2.5 SILTY LOAM (ML/OL), black HC stain.		1						1164		
493.0			2								
492.0			3			50					
491.0			4								
490.0			5								
489.0	5.5-7.5 SAND (SM/SC), brown-black, silty with some gravel, moist, and soft due to silt.		6			50			2288		
488.0			7								
487.0			8						570	(for a very small amount)	
486.0	8.0-10.0 SAND/GRAVEL (SW/GW), silty brown.		9						74		
485.0			10								
484.0	10.5-12.5 SAND (SW/GW), silty sand and gravel, less silt than above.		11			33			609		
483.0			12								
482.0			13								
481.0	13.0-15.0 SAND (SW), coarse-moist, gray-tan.		14			50			1119		
480.0			15								



## Illinois Environmental Protection Agency

## Field Boring Log

Page 2 of 3Site File No. 1790600011 County TazewellBoring No. EOD-2A Monitor Well No. NA

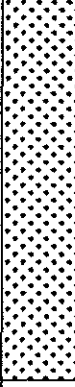
Elev.	DESCRIPTION	Graphic Log	Depth in feet	SAMPLES						Personnel
				Sample No.	Sample Type	Sample Recovery (%)	Pocket Penetrometer (tsf)	N Values (Blows)	OVA or PID readings (ppm)	G - Tom Nissen D - Mark Yiatras H - Steve Grace H - C. DeWolf
479.0	15.5-17.5 SAND (SW), coarse, dark; HC stain, gray-tan.		16			63			1705	
478.0			17							
477.0	18.0-20.0 SAND (SW), coarse, tan.		18			75			2205	
476.0			19							
475.0			20							
474.0	20.5-22.5 SAND (SW), coarse to medium, as above.		21			50			1760	
473.0			22							
472.0	23.0-25.0 SAND (SW), as above.		23			63			1080	
471.0			24							
470.0			25							
469.0	25.5-27.5 SAND (SW), as above.		26			63			1759	
468.0			27							
467.0	28.0-30.0 SAND (SW), as above.		28			75			1019	
466.0			29							
465.0	30.0-32.0 SAND (SW), as above.		30			66			1078	
464.0			31							
463.0			32							



## Illinois Environmental Protection Agency

## Field Boring Log

Page 3 of 3Site File No. 1790600011County TazewellBoring No. EOD-2AMonitor Well No. NA

		SAMPLES							Personnel	
Elev.	DESCRIPTION	Graphic Log	Depth in feet	Sample No.	Sample Type	Sample Recovery (%)	Pocket Penetrometer (tsf)	N Values (Blows)	OVA or PID readings (ppm)	G - Tom Nissen
										H - Mark Yiatras
										H - Steve Grace
										H - C. DeWolf
										REMARKS
	32.0-34.0 SAND (SW), as above.					50			709	Very small amount, 2 brass rings only.
462.0			33							
461.0	34.0-36.0 SAND (SW), as above.		34			33			687	Very small amount, 1 1/2 brass rings only.
460.0			35							
459.0			36							



# Illinois Environmental Protection Agency

## Field Boring Log

Page 1 of 3Site File No. 1790600011 County TazewellBoring No. EOD-3 Monitor Well No. NAFile Name Safety-Kleen Corp., Pekin Service Center, Pekin, ILSurface Elev. 495.0 Completion Depth 36.0D. ID. No. ILD-093-862-811Auger Depth 36.0' Rotary Depth NAQuadrangle Pekin, IL Sec. 15 T. 24 N R. 5 EDate: Start 8/9/94 Finish 8/9/94UTM Coord. N. 4489750.00 E. 274500.00Boring Location SW boring in tank excavation area.Drilling Equipment Scorpion Hyd. Probe

Elev.	DESCRIPTION	Graphic Log	Depth in feet	SAMPLES						Personnel	REMARKS
				Sample No.	Sample Type	Sample Recovery (%)	Pocket Penetrometer (tsf)	N Values (Blows)	OVA or PID readings (ppm)	G - Tom Nissen D - Mark Yiatras H - Steve Grace H - C. DeWolf	
	0-0.7 Concrete										Core concrete and drill
494.0	0.7-12.0 Sand backfill, blind drill.		1								
493.0			2								
492.0			3								
491.0			4								
490.0			5								
489.0			6								Blind drill through backfill 0.7-10.0'.
488.0			7								
487.0			8								
486.0			9								
485.0	10.0-12.0 SAND (SW), tan, arkosic, medium to coarse grained, loose, moist, poorly sorted.		10			75			1102		
484.0			11								Duplicate sample for IEPA, 1' offset.
483.0	12.0-14.0 SAND (SW), as above, slightly coarser.		12			83			969		
482.0			13								
481.0	14.0-16.0 SAND (SW/GW), as above, some granule size clasts.		14			91			901		
480.0			15								



Site File No. 1790600011

County Tazewell

Boring No. EOD-3

Monitor Well No. NA

				SAMPLES						Personnel
				Sample No.	Sample Type	Sample Recovery (%)	Pocket Penetrometer (tsf)	N Values (Blows)	OVA or PID readings (ppm)	G - Tom Nissen D - Mark Yiatras H - Steve Grace H - C. DeWolf
Elev.	DESCRIPTION	Graphic Log	Depth in feet							REMARKS
479.0	16.0-18.0 SAND (SW), as above, light tan.		16						689	
478.0			17							
477.0	18.0-20.0 SAND (SW), as above with minor pebbles and fines.		18						533	
476.0			19							
475.0	20.0-22.0 SAND (SW/SM), as above, coarse, arkosic with abundant lithic fragments, minor silty sand lens.		20						553	
474.0			21							
473.0	22.0-24.0 SAND (SW), as above.		22						378	
472.0			23							
471.0	24.0-26.0 SAND (SW), as above with minor fine sand.		24						198	
470.0			25							
469.0	26.0-28.0 SAND (SW)		26							
468.0			27							
467.0	28.0-30.0 SAND (SW)		28						193	
466.0			29							
465.0	30.0-32.0 SAND (SW), as above, moist but not saturated.		30						426	
464.0			31							
463.0			32							





Site File No. 1790600011

County Tazewell

Boring No. EOD-3

Monitor Well No. NA

				SAMPLES						Personnel
				Sample No.	Sample Type	Sample Recovery (%)	Pocket Penetrometer (tsf)	N Values (Blows)	OVA or PID readings (ppm)	G - Tom Nissen D - Mark Yiatras H - Steve Grace H - C. DeWolf
Elev.	DESCRIPTION	Graphic Log	Depth in feet							REMARKS
	32.0-34.0 SAND (SW), tan, arkosic, pebbly.								246	
462.0			33							
461.0	34.0-36.0 SAND (SW), pebbly, as above.		34							
460.0			35						200 +	
459.0			36							



# Illinois Environmental Protection Agency

## Field Boring Log

Page 1 of 2

Site File No. 1790600011 County Tazewell Boring No. EOD-4 Monitor Well No. NA

Site File Name Safety-Kleen Corp., Pekin Service Center, Pekin, IL Surface Elev. 495.0 Completion Depth 19.5

Fed. ID. No. ILD-093-862-811 Auger Depth 19.5' Rotary Depth NA

Quadrangle Pekin, II Sec. 15 T. 24 N R. 5 E Date: Start 8/10/94 Finish 8/10/94

UTM Coord. N. 4489750.00 E. 274500.00

Boring Location SE boring in tank excavation area.

Drilling Equipment Scorpion Hyd. Probe

Elev.	DESCRIPTION	Graphic Log	Depth in feet	SAMPLES						Personnel
				Sample No.	Sample Type	Sample Recovery (%)	Pocket Penetrometer (tsf)	N Values (Blows)	OVA or PID readings (ppm)	G - Tom Nissen D - Mark Yiatras H - Steve Grace H - C. DeWolf
	0-0.5 Concrete									
	0.5-10.0 Fill, Drilled blind.									
494.0			1							
493.0			2							
492.0			3							
491.0			4							
490.0			5							
489.0			6							
488.0			7							
487.0			8							
486.0			9							
485.0	10.0-12.0 CLAYEY silt and SAND (SC), tan; gray discoloration, moist silt 10.0 to 11.0', possible slough in tank fill, 11.0-12.0', coarse sand.		10			75			13	Sample collected as worst case, VOC sample contains some
484.0			11							discolored clayey silt with PID of 423 ppm based on
483.0			12							slough in 12.4-14.5 sample.
482.0	12.5-14.5 SAND (SW), coarse, as above, some slough in top 2 rings (gray-stained).		13			83			19	Note: Clayey, slough in collected sample.
481.0			14							
480.0			15							



Site File No. 1790600011

County Tazewell

Boring No. EOD-4

Monitor Well No. NA

Elev.	DESCRIPTION	Graphic Log	Depth in feet	SAMPLES						Personnel
				Sample No.	Sample Type	Sample Recovery (%)	Pocket Penetrometer (tsf)	N Values (Blows)	OVA or PID readings (ppm)	G - Tom Nissen D - Mark Yiatras H - Steve Grace H - C. DeWolf
										REMARKS
479.0	15.0-17.0 SAND (SW), tan coarse, as above. No odor, no stained slough.		16			75			0	Vertical extent verification sample.
478.0			17							
477.0	17.5-19.5 SAND (SW), medium brown, medium to coarse grained, some silt, loose, moist.		18			83			2.2	
476.0			19							



# Illinois Environmental Protection Agency

## Field Boring Log

Page 1 of 3

Site File No. 1790600011 County Tazewell

Boring No. EOD-5 Monitor Well No. NA

Site File Name Safety-Kleen Corp., Pekin Service Center, Pekin, IL

Surface Elev. 494.0 Completion Depth 36.0

Fed. ID. No. ILD-093-862-811

Auger Depth 36.0' Rotary Depth NA

Quadrangle Pekin, II Sec. 15 T. 24 N R. 5 E

Date: Start 8/10/94 Finish 8/10/94

UTM Coord. N. 4489750.00 E. 274500.00

Boring Location S of tank excavation, east of above ground tanks.

Drilling Equipment Scorpion Hyd. Probe

Elev.	DESCRIPTION	Graphic Log	Depth in feet	SAMPLES						Personnel	
				Sample No.	Sample Type	Sample Recovery (%)	Pocket Penetrometer (tsf)	N Values (Blows)	OVA or PID readings (ppm)	G - Tom Nissen	D - Mark Yiatras
										H - Steve Grace	H - C. DeWolf
										REMARKS	
	0-0.5 Concrete										
493.0	0.5-2.5 SILT LOAM (OL/ML), dark brown, clayey cohesive, soft, malleable.		1			83			0		
492.0			2								
491.0	3.0-5.0 SAND (SM/SP), fine quartz dominated, iron red stain, non-cohesive, silt in top 6", coarsens downward.		3			75			0		
490.0			4								
489.0			5								
488.0	5.5-7.5 SAND (SP), fine sand, red iron staining with minor medium sand and minor brown silt.		6			75			0		
487.0			7								
486.0	8.0-10.0 SAND/GRAVEL (SW/GW), tan to red brown, medium to coarse sand with up to 1 cm sized gravel, poorly sorted.		8			75			0		
485.0	- red brown gravelly silty clay in 2nd ring (8.5-9'), moist, perched water.		9								
484.0			10								
483.0	10.5-12.5 SAND (SP/SW), tan, coarse grained moderate to well sorted, arkosic.		11			91			0		
482.0			12								
481.0	13.0-15.0 SAND (SW), tan, coarse, moderately well sorted. As above. Interval of fine red sand 13.5-14.0, possibly slough.		13			83			0		
480.0			14								
479.0			15								

Silty clay also 0.0 TOV



Site File No. 1790600011

County Tazewell

Boring No. EOD-5

Monitor Well No. NA

Elev.	DESCRIPTION	Graphic Log	Depth in feet	SAMPLES						Personnel	
				Sample No.	Sample Type	Sample Recovery (%)	Pocket Penetrometer (tsf)	N Values (Blows)	OVA or PID readings (ppm)	G - Tom Nissen D - Mark Yiatras H - Steve Grace H - C. DeWolf	
										REMARKS	
478.0	15.5-17.5 SAND (SP/SW), tan, coarse, moderately well sorted as above, lens of silty sand at 16 to 16.5'.		16			75			0		
477.0			17								
476.0	18.0-20.0 SAND (SP/SW), tan, coarse, with silty lenses.		18			83			0		
475.0			19								
474.0			20								
473.0	20.5-22.5 SAND (SW), tan, coarse, as above with silty sand and gravel lenses at 21 to 22'.		21			91			0		
472.0			22								
471.0	23.0-25.0 SILTY SAND (SW/SM), brown, gravelly, poorly sorted, wet to moist.		23						0		
470.0			24								
469.0			25								
468.0	25.5-27.5 SAND (SW), tan, coarse, moist.		26						0		
467.0			27								
466.0	28.0-30.0 SAND (SW), coarse, angular, moderately sorted, moderately well rounded, arkosic, moist.		28			75			0		
465.0			29								
464.0			30								
463.0			31								
462.0			32								



## Illinois Environmental Protection Agency

## Field Boring Log

Page 3 of 3Site File No. 1790600011 County TazewellBoring No. EOD-5 Monitor Well No. NA

Elev.	DESCRIPTION	Graphic Log	Depth in feet	SAMPLES						Personnel
				Sample No.	Sample Type	Sample Recovery (%)	Pocket Penetrometer (tsf)	N Values (Blows)	OVA or PID readings (ppm)	REMARKS
	32.0-34.0 SAND (SW), as above, moist not wet.					75			0	
461.0			33							
460.0	34.0-36.0 SAND (SW), as above, moist, not wet.		34						0	
459.0			35							
458.0			36							



## Illinois Environmental Protection Agency

## Field Boring Log

Page 1 of 3Site File No. 1790600011 County TazewellBoring No. EOD-6 Monitor Well No. NAFile Name Safety-Kleen Corp., Pekin Service Center, Pekin, ILSurface Elev. 494.0 Completion Depth 36.0Fed. ID. No. ILD-093-862-811Auger Depth 36.0' Rotary Depth NAQuadrangle Pekin, II Sec. 15 T. 24 N R. 5 EDate: Start 8/11/94 Finish 8/11/94UTM Coord. N. 4489750.00 E. 274500.00Boring Location NW of tank excavation area.Drilling Equipment Scorpion Hyd. Probe

Elev.	DESCRIPTION	Graphic Log	Depth in feet	SAMPLES						Personnel	REMARKS
				Sample No.	Sample Type	Sample Recovery (%)	Pocket Penetrometer (tsf)	N Values (Blows)	OVA or PID readings (ppm)	G - Tom Nissen D - Mark Yiatras H - Steve Grace H - C. DeWolf	
493.0	0-0.5 Concrete										
492.0	0.5-2.5 CLAY (CL) and SAND (SW), gray, discolored; clay from 0.5 to 0.8', sand 0.8 to 2.5'; clay firm, cohesive, sand coarse grained, arkosic, poorly sorted, loose, moist.		1			66			518		Sample to lab.
491.0	3.0-5.0 SAND (SW), red-brown, medium to coarse grained, loose, moist, minor pebbles, minor fines.		2								
490.0			3			66			6		
489.0			4								
488.0	5.5-7.5 SAND (SW), tan, coarse grained, no fines, loose, moist.		5								
487.0			6			66			2.2		
486.0	8.0-10.0 SAND (SW), as above.		7								
485.0			8			66			4.4		
484.0			9								
483.0	10.5-12.5 SAND (SW), tan, medium to coarse grained, slightly moist, loose.		10								
482.0			11			66			2.2		
480.0	13.0-15.0 SAND and GRAVEL (SW/GW), tan, fine to coarse grained, pebbles up to 1" long, loose, moist.		12								
479.0			13			66			0		Note: Upper 2 rings contained slough, some gray stained from 0.5-2.5 interval. This sample not used for lab.
			14								
			15								



Site File No. 1790600011

County Tazewell

Boring No. EOD-6

Monitor Well No. NA

Elev.	DESCRIPTION	Graphic Log	Depth in feet	SAMPLES						Personnel	REMARKS
				Sample No.	Sample Type	Sample Recovery (%)	Pocket Penetrometer (tsf)	N Values (Blows)	OVA or PID readings (ppm)	G - Tom Nissen D - Mark Yiatras H - Steve Grace H - C. DeWolf	
478.0	15.5-17.5 SAND (SW), tan, coarse grained, loose, moist, no gravel.		16			75			0		Sample for lab use as bottom of invert sample.
477.0			17								
476.0	18.0-20.0 SAND (SW/CL), as above with one 3" clay layer, light brown, silty.		18						17		
475.0			19								
474.0			20								
473.0			21								
472.0			22								
471.0			23								
470.0			24								
469.0	25.0-27.0 SAND (SW), tan, coarse grained, poorly sorted, loose, moist, no gravel.		25			75			0		
468.0			26								
467.0			27								
466.0			28								
465.0			29								
464.0	30.0-32.0 SAND (SW), as above.		30			83			0		
463.0			31								
462.0			32								




Site File No. 1790600011

County Tazewell

Boring No. EOD-6

Monitor Well No. NA

				SAMPLES						Personnel
Elev.	DESCRIPTION	Graphic Log	Depth in feet	Sample No.	Sample Type	Sample Recovery (%)	Pocket Penetrometer (tsf)	N Values (Blows)	OVA or PID readings (ppm)	REMARKS
	32.0-34.0 SAND (SW), as above.					83			0	
461.0										
460.0	34.0-36.0 SAND (SW), as above.					91			0	Sample to lab.
459.0										
458.0			36							



## Illinois Environmental Protection Agency

## Field Boring Log

Page 1 of 3

Site File No. 1790600011 County Tazewell

Boring No. EOD-7 Monitor Well No. NA

Site File Name Safety-Kleen Corp., Pekin Service Center, Pekin, IL

Surface Elev. 495.0 Completion Depth 36.0

Fed. ID. No. ILD-093-862-811

Auger Depth 36.0' Rotary Depth NA

Quadrangle Pekin, II Sec. 15 T. 24 N R. 5 E

Date: Start 8/11/94 Finish 8/11/94

UTM Coord. N. 4489750.00 E. 274500.00

Boring Location Former pipe run area, N of former USTs.

Drilling Equipment Scorpion Hyd. Probe

Elev.	DESCRIPTION	Graphic Log	Depth in feet	SAMPLES						Personnel	
				Sample No.	Sample Type	Sample Recovery (%)	Pocket Penetrometer (tsf)	N Values (Blows)	OVA or PID readings (ppm)	REMARKS	
	0-0.5 Concrete									PID increments 0.0 to 2.2 to 4.4.	
494.0	0.5-2.5 SILT LOAM (ML/OL), brown, minor dark brown oxidized blebs, soft, slightly cohesive, moist. Note: gray-black staining in middle two rings (used for organics analysis).		1			75			8.0		
493.0			2								
492.0	3.0-5.0 SAND (SW), red brown, medium to coarse grained. Abundant natural charcoal (black wood - same as oxidized blebs above. Loose, moist, insufficient sample for analysis (to confirm vertical extent of pipe chase: impacts.		3			50			2.2		
491.0			4								
490.0			5								
489.0	5.5-7.5 SAND (SW), as above with no charcoal but some oxidation as in 0.5 to 2.5.		6			66			2.2	Lab	
488.0			7								
487.0	8.0-10.0 SAND (SW), tan, arkosic, very coarse grained, pebbly, poorly sorted, abundant charcoal specks, loose, moist.		8			50			2.2		
486.0			9								
485.0			10								
484.0	10.5-12.5 SAND (SW), tan, very coarse grained, pebbly with fine sand (i.e., "dirty sand"), loose, moist.		11			42			2.2		
483.0			12								
482.0	13.0-15.0 SAND (SW/ML), as above with thin (2 to 4" ?) silt layer partly in tube collected for VOC analysis (not opened).		13			50			2.2	Lab	
481.0			14								
480.0			15								



Site File No. 1790600011

County Tazewell

Boring No. EOD-7

Monitor Well No. NA

Elev.		DESCRIPTION	Graphic Log	Depth in feet	SAMPLES						Personnel	REMARKS
					Sample No.	Sample Type	Sample Recovery (%)	Pocket Penetrometer (tsf)	N Values (Blows)	OVA or PID readings (ppm)	G - Tom Nissen D - Mark Yiatras H - Steve Grace H - C. DeWolf	
479.0		15.5-17.5 SAND (SW), "dirty" as in 10.5 to 12.5.		16			62			2.2		
478.0				17								
477.0		18.0-20.0 SAND (SW), tan, coarse to very coarse grained, no fines or gravel, loose, moist; contact with dirty sand above is at 19'.		18			58			2.2		
476.0				19								
475.0				20								
474.0				21								
473.0				22								
472.0				23								
471.0				24								
470.0		25.0-27.0 SAND (SW), as above.		25			75			0		
469.0				26								
468.0				27								
467.0				28								
466.0				29								
465.0		30.0-32.0 SAND (SW), as above, some crumbly, slightly compacted layers with minor fines (possible slough), moist.		30			75			44		
464.0				31								
463.0				32								



## Illinois Environmental Protection Agency

## Field Boring Log

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Site File No. 1790600011 County Tazewell

Boring No. EOD-7 Monitor Well No. NA

Elev.	DESCRIPTION	Graphic Log	Depth in feet	SAMPLES						Personnel	REMARKS
				Sample No.	Sample Type	Sample Recovery (%)	Pocket Penetrometer (tsf)	N Values (Blows)	OVA or PID readings (ppm)	G - Tom Nissen D - Mark Yiatras H - Steve Grace H - C. DeWolf	
462.0	32.0-34.0 SAND (SW), tan, coarse grained, minor fines, loose, moist, no water.		33			83			0		
461.0	34.0-36.0 SAND (SW), tan, coarse grained, pebbly, minor fines (i.e., "dirty sand").		34			66			8.0	Lab sample	
460.0			35								
459.0			36								



## Illinois Environmental Protection Agency

## Field Boring Log

Page 1 of 3Site File No. 1790600011 County TazewellBoring No. EOD-8 Monitor Well No. NASite File Name Safety-Kleen Corp., Pekin Service Center, Pekin, ILSurface Elev. 495.0 Completion Depth 36.0ID. No. ILD-093-862-811Auger Depth 36.0' Rotary Depth NAQuadrangle Pekin, IISec. 15 T. 24 N R. 5 EDate: Start 8/11/94 Finish 8/11/94UTM Coord. N. 4489750.00E. 274500.00Boring Location On gravel east of tanks.Drilling Equipment Scorpion Hyd. Probe

Elev.

DESCRIPTION

Graphic  
LogDepth  
in feet

Sample No.

Sample Type

Sample  
Recovery (%)Pocket  
Penetrometer (tsf)

N Values (Blows)

OVA or PID  
readings (ppm)

Personnel

G - Tom Nissen  
D - Mark Yiatras  
H - Steve Grace  
H - C. DeWolf

REMARKS

0-0.5 Concrete

0.5-2.5 SILT (ML), black; dark brown, clayey.

3.0-5.0 SAND (SP), red, firm.

5.5-7.5 SAND (SP), red, fine, some silt.

8.0-10.0 SAND (SP), red, fine.

10.5-12.5 SAND (SP), as above with minor silt,  
rock fragments.

13.0-15.0 SAND (SP), as above.

## SAMPLES

## Personnel

G - Tom Nissen  
D - Mark Yiatras  
H - Steve Grace  
H - C. DeWolf

REMARKS



Site File No. 1790600011

County Tazewell

Boring No. EOD-8

Monitor Well No. NA

				SAMPLES						Personnel
				Sample No.	Sample Type	Sample Recovery (%)	Pocket Penetrometer (tsf)	N Values (Blows)	OVA or PID readings (ppm)	G - Tom Nissen D - Mark Yiatras H - Steve Grace H - C. DeWolf
Elev.	DESCRIPTION	Graphic Log	Depth in feet							REMARKS
479.0	15.5-17.5 SAND (SW), tan, medium to coarse, coarser than above, arkosic, angular to sub-rounded, moist.		16			66			0	
478.0			17							
477.0	18.0-20.0 SAND (SW), coarse, tan, as above.		18			83			0	
476.0			19							
475.0			20							
474.0			21							
473.0			22							
472.0			23							
471.0			24							
470.0	25.0-27.0 SAND (SW), coarse, tan, as above.		25			83			0	
469.0			26							
468.0			27							
467.0			28							
466.0			29							
465.0	30.0-32.0 SAND (SW), coarse, tan, less well sorted than above, more fines, moist.		30			66			0	
464.0			31							
463.0			32							



Site File No. 1790600011

County Tazewell

Boring No. EOD-8

Monitor Well No. NA

				SAMPLES						Personnel
				Sample No.	Sample Type	Sample Recovery (%)	Pocket Penetrometer (tsf)	N Values (Blows)	OVA or PID readings (ppm)	G - Tom Nissen D - Mark Yiatras H - Steve Grace H - C. DeWolf
Elev.	DESCRIPTION			Graphic Log	Depth in feet					REMARKS
	32.0-34.0 SAND (SW), as above, moist.					66			0	
462.0					33					
461.0	34.0-36.0 SAND (SW), as above, moist.				34	66			0	
460.0					35					
459.0					36					



# Illinois Environmental Protection Agency

## Field Boring Log

Page 1 of 3

Site File No. 1790600011 County Tazewell Boring No. EOD-9 Monitor Well No. NA

Site File Name Safety-Kleen Corp., Pekin Service Center, Pekin, IL Surface Elev. 494.5 Completion Depth 36.0

Fed. ID. No. ILD-093-862-811 Auger Depth 36.0' Rotary Depth NA

Quadrangle Pekin, II Sec. 15 T. 24 N R. 5 E Date: Start 8/11/94 Finish 8/11/94

UTM Coord. N.                      E.                     

Boring Location N of old warehouse building.

Drilling Equipment Scorpion Hyd. Probe

Elev.	DESCRIPTION	Graphic Log	Depth in feet	SAMPLES						Personnel	
				Sample No.	Sample Type	Sample Recovery (%)	Pocket Penetrometer (tsf)	N Values (Blows)	OVA or PID readings (ppm)	G - Tom Nissen	D - Mark Yiatras
										H - Steve Grace	H - C. DeWolf
										REMARKS	
	0-2.5 SILT LOAM (ML/OL) black-dark brown.					50			0	Collect for background	
493.5			1								
492.5			2								
	SAND (SM), fine red.					75			0	Collect for background	
491.5			3								
490.5			4								
489.5	5.0-7.0 SAND (SP), fine red with charcoal fragments.		5			75			0		
488.5			6								
487.5			7								
486.5	7.5-9.5 SAND (SP), fine, red, grading to coarse tan.		8			75			0		
485.5			9								
484.5	10.0-11.5 SAND (SW), coarse, tan, poorly sorted, no silt, transition to silt at 11.5'.		10			75					
483.5			11								
482.5	11.5-12.0 SILT (ML), light brown, clayey, stiff, somewhat crumbly.		12						0		
481.5	12.5-14.5 SAND (SW), coarse, tan poorly sorted, non-cohesive, no silt, no evidence of impact.		13			75			0		
480.5			14								
479.5			15								





## Illinois Environmental Protection Agency

## Field Boring Log

Page 2 of 3

Site File No. 1790600011

County Tazewell

Boring No. EOD-9

Monitor Well No. NA

				SAMPLES						Personnel
				Sample No.	Sample Type	Sample Recovery (%)	Pocket Penetrometer (tsf)	N Values (Blows)	OVA or PID readings (ppm)	G - Tom Nissen D - Mark Yiatras H - Steve Grace H - C. DeWolf
Elev.	DESCRIPTION			Graphic Log	Depth in feet					REMARKS
	15.0-17.0 SAND (SW), coarse, tan, with lenses of finer sand with minor silt content.					75			0	
478.5					16					
477.5					17					
	17.5-19.5 SAND (SW), coarse tan, coarser than above fines in top of sampler, probably slough.					75			1.4	
476.5					18					
475.5					19					
474.5					20					
473.5					21					
472.5					22					
471.5					23					
470.5					24					
469.5	25.0-27.0 SAND (SW), coarse, tan as above.				25	75			1.4	PID baseline variation 1.4-4.3
468.5					26					
467.5					27					
466.5					28					
465.5					29					
464.5	30.0-32.0 SAND (SW), coarse, tan. Some pebbles.				30	75			1.4	
463.5					31					
462.5					32					

Site File No. 1790600011

County Tazewell

Boring No. EOD-9

Monitor Well No. **NA**

Elev.	DESCRIPTION	Graphic Log	Depth in feet	SAMPLES						Personnel
				Sample No.	Sample Type	Sample Recovery (%)	Pocket Penetrometer (tsf)	N Values (Blows)	OVA or PID readings (ppm)	REMARKS
	32.0-34.0 SAND (SW), as above, moist, possibly saturated.					75				G - Tom Nissen D - Mark Yiatras H - Steve Grace H - C. DeWolf
461.5			33							
460.5	34.0-36.0 SAND (SW), as above, moist, possibly saturated.		34			75			1.4	
459.5			35							
458.5			36							

Site File No. 1790600011 County Tazewell

Boring No. EOD-10 Monitor Well No. NA

Site File Name Safety-Kleen Corp., Pekin Service Center, Pekin, IL

Surface Elev. 490.0 Completion Depth 36.0

ID. No. ILD-093-862-811

Auger Depth 36.0' Rotary Depth NA

Quadrangle Pekin, II Sec. 15 T. 24 N R. 5 E Date: Start 8/11/94 Finish 8/11/94

UTM Coord. N. 4489750.00 E. 274500.00

Boring Location On lower driveway, west of above ground tanks.

**Drilling Equipment      Scorpion Hyd. Probe**

## SAMPLES

## Personnel

G - Tom Nissen  
D - Mark Yiatras  
H - Steve Grace  
H - C. DeWolf

## REMARKS

Depth (ft)	Soil Description	Soil Type	Moisture (%)	Temperature (°C)	Notes
489.0	0.5-2.5 SAND (SP), fine, red, decreasing silt/loam from 0.5 to 2.0'.	1	50	0	Note: background on PID 0-4.3
488.0		2			
487.0	3.0-5.0 SAND (SP), red silty.	3	83	0	
486.0		4			
485.0		5			
484.0	5.5-7.5 SAND (SW), reddish tan, poorly sorted coarse-medium sand, minor chert pebbles.	6	58	0	
483.0		7			
482.0	8.0-10.0 SAND (SW), as above with greater abundance of coarse fragments and pebbles, arkosic.	8	66	0	
481.0		9			
480.0		10			
479.0	10.5-12.5 SAND (SW), as above.	11	75	0	
478.0		12			
477.0	13.0-15.0 SAND (SW), as above.	13	75	0	
476.0		14			
475.0		15			



## Illinois Environmental Protection Agency

## Field Boring Log

Page 2 of 3Site File No. 1790600011County TazewellBoring No. EOD-10 Monitor Well No. NA

Elev.	DESCRIPTION	Graphic Log	Depth in feet	SAMPLES						Personnel	REMARKS
				Sample No.	Sample Type	Sample Recovery (%)	Pocket Penetrometer (tsf)	N Values (Blows)	OVA or PID readings (ppm)	G - Tom Nissen D - Mark Yiatras H - Steve Grace H - C. DeWolf	
474.0			16								
473.0			17								
472.0			18								
471.0			19								
470.0	20.0-22.0 SAND (SP/SW), coarse tan sand 20 to 21.5 as above. 21.5 to 22.0 fine tan sand, moderately well sorted.		20			75			0		
469.0			21								
468.0			22								
467.0			23								
466.0			24								
465.0			25								
464.0			26								
463.0			27								
462.0	28.0-30.0 SAND (SP), tan, alternating coarse pebbly with fine grained well sorted, loose, moist coarse pebbly sand.		28			66			0		
461.0			29								
460.0	30.0-32.0 SAND (SP), as above, fine grained in bottom 4" other pebbly sand may be slough.		30			66			0		
459.0			31								
458.0			32								



Site File No. 1790600011

County Tazewell

Boring No. EOD-10

Monitor Well No. NA

Elev.		DESCRIPTION	Graphic Log	Depth in feet	SAMPLES						Personnel
					Sample No.	Sample Type	Sample Recovery (%)	Pocket Penetrometer (tsf)	N Values (Blows)	OVA or PID readings (ppm)	G - Tom Nissen D - Mark Yiatras H - Steve Grace H - C. DeWolf
		32.0-34.0 SAND (SW), tan, medium to coarse grained, loose, moist.					83			0	REMARKS Note: dried mud on bottom probe rod.
457.0				33							
456.0		34.0-36.0 SAND (SW), as above with minor pebbles.		34			75			0	
455.0				35							
454.0				36							

Site File No. 1790600011 County Tazewell Boring No. BG-1 Monitor Well No. NA

Site File Name Safety-Kleen Corp., Pekin Service Center, Pekin, IL Surface Elev. 492.5 Completion Depth 15.0

Fed. ID. No. ILD-093-862-811 Auger Depth 15.0' Rotary Depth NA

Quadrangle Pekin, II Sec. 15 T. 24 N R. 5 E Date: Start 8/12/94 Finish 8/12/94

UTM Coord. N. \_\_\_\_\_ E. \_\_\_\_\_

Boring Location NW corner of old site, top of graded hill

Drilling Equipment      Scorpion Hyd. Probe

Elev.	DESCRIPTION	Grain Log	Depth in feet	Samp	Samp	Samp Recov	Pocket Penet	N Val	OVA reading	REMARKS
-491.5	0-2.5 SILT LOAM (ML/OL), black to dark brown, crumbly, root fragments.	[Pattern]	1		[Pattern]	50			3.5	Note - PID background variation 0-3 ppm
-490.5		[Pattern]	2		[Pattern]					
-489.5	3.0-5.0 SAND (SM/SP), fine red.	[Pattern]	3		[Pattern]	50			2.6	
-488.5		[Pattern]	4		[Pattern]					
-487.5		[Pattern]	5		[Pattern]					
-486.5	5.5-7.5 SAND (SP), fine red grading to fine-medium tan. Less coarse than other locations.	[Pattern]	6		[Pattern]	50			3.5	
-485.5		[Pattern]	7		[Pattern]					
-484.5	8.0-10.0 SAND (SP), fine red - medium tan, abundant lithic fragments.	[Pattern]	8		[Pattern]	50			2.6	
-483.5		[Pattern]	9		[Pattern]					
-482.5		[Pattern]	10		[Pattern]					
-481.5	10.5-12.5 SAND (SP), fine to medium tan, well sorted "beach" sand.	[Pattern]	11		[Pattern]	63			2.6	
-480.5		[Pattern]	12		[Pattern]					
-479.5	13.0-15.0 SAND (SP), medium coarse, to fine, tan, not as coarse as either locations.	[Pattern]	13		[Pattern]					
-478.5		[Pattern]	14		[Pattern]					
-477.5		[Pattern]	15		[Pattern]					Duplicate of 0.5-2.5



## Illinois Environmental Protection Agency

## Field Boring Log

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Site File No. 1790600011 County Tazewell

Boring No. BG-2 Monitor Well No. NA

File Name Safety-Kleen Corp., Pekin Service Center, Pekin, IL

Surface Elev. 495.3 Completion Depth 15.0

Fed. ID. No. ILD-093-862-811

Auger Depth 15.0' Rotary Depth NA

Quadrangle Pekin, II Sec. 15 T. 24 N R. 5 E Date: Start 8/12/94 Finish 8/12/94

UTM Coord. N. E.

Boring Location NE corner of property, 15' SW of telephone pole.

Drilling Equipment Scorpion Hyd. Probe

Elev.	DESCRIPTION	Graphic Log	Depth in feet	SAMPLES						Personnel	
				Sample No.	Sample Type	Sample Recovery (%)	Pocket Penetrometer (tsf)	N Values (Blows)	OVA or PID readings (ppm)	G - T. Nissen	D - Mark Yiatras
										H - C. DeWolf	
											REMARKS
494.3	0-2.5 SILT LOAM (ML/OL), dark brown to light brown, dry, crumbly, root fragments.		1			50					
493.3			2								
492.3	3.0-5.0 SAND (SP), fine red, very little silt, well sorted, quartz feldspar, very few lithic fragments; clean reddish sand.		3			75			4.6		
491.3			4								
490.3			5								
489.3	5.5-7.5 SAND (SP), fine red to tan, minor lithic fragments, no silt, well sorted.		6			75			3.5		
488.3			7								
487.3	8.0-10.0 SAND/GRAVEL/SILT (SW/GW), fine sand coarsening to silty gravel at 9.0'. Thin 3" silt (brown) layer below (9-10'). Poorly sorted coarse sand and gravel with some silt.		8			75			3.5		Sampled sandy gravel for metals
486.3			9								
485.3			10								
484.3	10.5-12.5 SAND/GRAVEL (SW/GW), very coarse sand and gravel. Abundant lithic fragments.		11			75			3.5		
483.3			12								
482.3			13			75			2.6		
481.3	SAND/GRAVEL (SW/GW), coarse sand, tan with major gravel, some silty sand and gravel 13-14'. Clean 14-15'.		14								
480.3			15								



# Illinois Environmental Protection Agency

## Field Boring Log

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Site File No. 1790600011 County Tazewell Boring No. BG-3 Monitor Well No. NA  
 Site File Name Safety-Kleen Corp., Pekin Service Center, Pekin, IL Surface Elev. 495.5 Completion Depth 36.0  
 Fed. ID. No. ILD-093-862-811 Auger Depth 36.0' Rotary Depth NA  
 Quadrangle Pekin, II Sec. 15 T. 24 N R. 5 E Date: Start 8/12/94 Finish 8/12/94

UTM Coord. N. \_\_\_\_\_ E. \_\_\_\_\_

Boring Location SE of tank basin, 5'.

Drilling Equipment Scorpion Hyd. Probe

Elev.	DESCRIPTION	Graphic Log	Depth in feet	SAMPLES						Personnel	
				Sample No.	Sample Type	Sample Recovery (%)	Pocket Penetrometer (tsf)	N Values (Blows)	OVA or PID readings (ppm)	REMARKS	
	0-2.0 CLAY (CL), silty, dark, semi-malleable, slightly soft, moist.								0	Begin 0945 - continuous sample	
494.5			1								
493.5	2.0-4.0 SILTY LOAM (ML/OL), brown, to dark brown, crumbly, moist.		2						3.5		
492.5			3								
491.5	4.0-6.0 SILTY LOAM (ML/OL), as above to 5.5. Fine red sand 5.5-6.0.		4			63			2.6		
490.5			5								
489.5	6.0-8.0 SAND (SM), fine, dark red to very dark red, moist. Minor lithic fragments.		6			63			2.6		
488.5			7								
487.5	8.0-10.0 SAND (SP), fine dark red saturated, 8-9'. GRAVEL (GM), silty brown 9-9.5. CLAY (CL), silty brown, 9.5-10'. All moist-wet.		8			63			1.7	Perched water on clay interval	
486.5			9								
485.5	10.0-12.0 SILTY SAND/GRAVEL (SM/GW), tan, brown, moist.		10			33			1.7		
484.5			11								
483.5	12.0-14.0 SAND (SW), coarse, brown, poorly sorted with approximately 5-10% gravel and 10-20% finer sand, moist, abundant feldspar and lithic fragments.		12			50			2.6	Moisture from above?	
482.5			13								
481.5	14.0-16.0 SAND (SW), coarse, tan, no silt, some medium but no fines. Quartz, with some feldspar and dark lithic fragments. Clean.		14			75			1.7	Sample for background	
480.5			15								





## Illinois Environmental Protection Agency

## Field Boring Log

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Site File No. 1790600011 County Tazewell

Boring No. BG-3 Monitor Well No. NA

Elev.	DESCRIPTION	Graphic Log	Depth in feet	SAMPLES						Personnel	REMARKS
				Sample No.	Sample Type	Sample Recovery (%)	Pocket Penetrometer (tsf)	N Values (Blows)	OVA or PID readings (ppm)	G - T. Nissen D - Mark Yiatras H - Steve Grace H - C. DeWolf	
479.5	16.0-18.0 SAND (SW), as above.		16			58			2.6		
478.5			17								
477.5	18.0-20.0 SAND (SW), coarse tan, some fine to medium sand (30%).		18			67			1.7		
476.5			19								
475.5	20.0-22.0 SAND (SW), coarse to medium tan sand, arkosic, 10% lithic fragments.		20			75			1.7		
474.5			21								
473.5	22.0-24.0 SAND (SW), as above.		22			67			2.6		
472.5			23								
471.5	24.0-26.0 SAND (SW), tan-brown medium to coarse, some fines and silt (10 - 20%).		24			67			3.5		
470.5			25								
469.5	26.0-28.0 SAND (SW), tan, medium moist, with equal amounts of fine and coarse sand. Same relative abundance of fine and coarse 20% each.		26			63			3.5		
468.5			27								
467.5	28.0-30.0 SAND (SW), as above, moist.		28						2.6		
466.5			29								
465.5	30.0-32.0 SAND (SW), as above, moist.		30			75			3.5		
464.5			31								
463.5			32								



## Illinois Environmental Protection Agency

## Field Boring Log

Page 3 of 3Site File No. 1790600011County TazewellBoring No. BG-3Monitor Well No. NA

Elev.		DESCRIPTION	Graphic Log	Depth in feet	SAMPLES						Personnel
					Sample No.	Sample Type	Sample Recovery (%)	Pocket Penetrometer (tsf)	N Values (Blows)	OVA or PID readings (ppm)	
		32.0-34.0 SAND (SW), as above, moist.					75			2.6	G - T. Nissen D - Mark Yiatras H - Steve Grace H - C. DeWolf
462.5				33							
461.5		34.0-36.0 SAND (SP), fine-medium tan sand, finer than above, with 10% gravel fragments poorly sorted.		34			63			3.5	
460.5				35							
459.5				36							Duplicate 4-6 for sample 1120

APPENDIX C-2

LOG-OF-BOREHOLE FORMS FOR MONITORING WELLS





## Illinois Environmental Protection Agency

## Field Boring Log

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Site File No. 1790600011 County Tazewell

Boring No. MW-1 Monitor Well No. MW-1

Site File Name Safety-Kleen Corp., Pekin Service Center, Pekin, IL

Surface Elev. 488.6 Completion Depth 37.0

ed. ID. No. ILD 093 862 811

Auger Depth 37.0 Rotary Depth

Quadrangle Pekin Sec. 15 T. 24N R. 5E

Date: Start 8/15/94 Finish 8/15/94

UTM Coord. N. 4489750.00 E. 274500.00

Boring Location SE corner of new building, on grass

Drilling Equipment Diedrich D-120

## SAMPLES

## Personnel

G - Charlie DeWolf  
D - Roger Burton  
H - T. Bartholomew  
H -

Elev.	DESCRIPTION	Graphic Log	Depth in feet	Sample No.	Sample Type	Sample Recovery (%)	Pocket Penetrometer (tsf)	N Values (Blows)	OVA or PID readings (ppm)	REMARKS
487.6	Grass on surface		1							
486.6	0.0-3.0 SILT (ML) Brown to dark brown, dry, crumbly, brittle		2							
485.6	3.0-5.0 POORLY GRADED SAND (SP); Sand, fine, red to brown, with minor silt. Non-cohesive, dry.		3							
484.6			4							
483.6	5.0-10.0 SILTY SAND/ SILTY GRAVEL (SM/GM) Brown silty sand and gravel. Moist. Sand is mainly coarse with abundant feldspar and lithic fragments. Silt 10-20%. Gravel fragments up to one cm in diameter.		5			100		2/1/1/2	7.0	TOV on cuttings 8.3, TOV on empty ziploc (background 1-7 ppm)
482.6			6							
481.6			7							
480.6			8							
479.6			9							
478.6	10.0-15.0 WELL GRADED SAND (SW); Sand, coarse with minor medium brown to tan sand. Very few fines. Quartz, feldspar and minor lithic (granite) fragments occasionally up to pebble size.		10			100		5/6/8/9	6.0	
477.6			11							
476.6			12							
475.6			13							
474.6			14							
473.6			15							



## Illinois Environmental Protection Agency

## Field Boring Log

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Site File No. 1790600011

County Tazewell

Boring No. MW-1

Monitor Well No. MW-1


Elev.	DESCRIPTION	Graphic Log	Depth in feet	SAMPLES						Personnel	REMARKS
				Sample No.	Sample Type	Sample Recovery (%)	Pocket Penetrometer (tsf)	N Values (Blows)	OVA or PID readings (ppm)	G - Charlie DeWc D - Roger Burton H - T. Bartholomew	
472.6	15.0-20.0 WELL GRADED SAND (SW); Sand, medium to coarse, tan. Fine sand approximately 20 %. Quartz, minor feldspar and lithic fragments as above.		16			100		6/ 7/ 8/ 10	6.3		
471.6			17								
470.6			18								
469.6			19								
468.6	20.0-25.0 WELL GRADED SAND (SW); Sand, medium to coarse, tan, as above.		20			100		6/ 6/ 7/ 7	8.0		
467.6			21								
466.6			22								
465.6			23								
464.6			24								
463.6	25.0-30.0 WELL GRADED SAND (SW) Sand, Medium to coarse, as above.		25			100		3/ 5/ 9/ 9	9		
462.6			26								
461.6			27								
460.6			28								
459.6			29								
458.6	30.0-35.0 WELL GRADED SAND (SW); Sand, medium to coarse tan as above. Wet, saturated.		30			100		4/ 5/ 9/ 10	8.0		Approximate water table 29.50'
457.6			31								
456.6			32								

Site File No. 1790600011

County Tazewell

Boring No. MW-1

Monitor Well No. MW-1

			SAMPLES							Personnel
Elev.	DESCRIPTION	Graphic Log	Depth in feet	Sample No.	Sample Type	Sample Recovery (%)	Pocket Penetrometer (tsf)	N Values (Blows)	OVA or PID readings (ppm)	REMARKS
455.6	TD = 37.0		33							
454.6			34							
453.6			35							
452.6			36							
451.6			37							



## Illinois Environmental Protection Agency

## Field Boring Log

Page 1 of 3Site File No. 1790600011 County TazewellBoring No. MW-2A Monitor Well No. MW-2ASite File Name Safety-Kleen Corp., Pekin Service Center, Pekin, ILSurface Elev. 488.9 Completion Depth 37Fed. ID. No. ILD 093 862 811Auger Depth 37.0 Rotary Depth \_\_\_\_\_Quadrangle Pekin Sec. 15 T. 24N R. 5EDate: Start 8/17/94 Finish 8/17/94UTM Coord. N. 4489750.00 E. 274500.00Boring Location 10 ft W of first park space, 3 ft N of sidewalkDrilling Equipment Diedrich D-120

## SAMPLES

## Personnel

G - Charlie DeWolf  
D - Roger Burton  
H - T. Bartholomew  
H -

Elev.	DESCRIPTION	Graphic Log	Depth in feet	Sample No.	Sample Type	Sample Recovery (%)	Pocket Penetrometer (tsf)	N Values (Blows)	OVA or PID readings (ppm)	REMARKS
487.9	Grass on surface		1							
486.9	0.0-10.0 WELL GRADED SAND (SW); Sand, coarse to medium tan, with few fines.		2							
485.9			3							
484.9			4							
483.9			5			100		2/ 3/ 3/ 4	5.0	
482.9			6							
481.9			7							
480.9			8							
479.9			9							
478.9	10.0-15.0 WELL GRADED SAND (SW) Sand, coarse, tan, as above.		10			100		4/ 7/ 9/ 10	2.6	
477.9			11							
476.9			12							
475.9			13							
474.9			14							
473.9			15							





Site File No. 1790600011

County Tazewell

Boring No. MW-2A Monitor Well No. MW-2A

Elev.	DESCRIPTION	Graphic Log	Depth in feet	SAMPLES						Personnel	REMARKS
				Sample No.	Sample Type	Sample Recovery (%)	Pocket Penetrometer (tsf)	N Values (Blows)	OVA or PID readings (ppm)	G - Charlie DeWolf D - Roger Burton H - T. Bartholomew H -	
472.9	15.0-20.0 POORLY GRADED SAND (SP); Sand, fine, tan 15-16 ft, medium to coarse tan 16-17 ft. Dark brown to black fine sand 17-19 feet.		16			100		5/ 7/ 9/ 9	1.3		
471.9			17								
470.9			18								
469.9			19								
468.9	20.0-25.0 SILTY SAND (SM) Sand, brown, to tan, coarse, slightly silty.		20			100		NA	1.3		
467.9			21								
466.9			22								
465.9			23								
464.9	25.0-30.0 WELL GRADED SAND AND GRAVEL (SW/GW); Sand, brown, coarse with rounded gravel clasts up to 1 cm. Some fine sand and silt. Moist, not saturated.		24								
463.9			25			100		4/ 6/ 7/ 7	1.3		
462.9			26								
461.9			27								
460.9	30.0-35.0 WELL GRADED SAND AND GRAVEL (SW/GW); Sand and gravel, brown, somewhat silty, saturated.		28								
459.9			29								
458.9			30			100		4/ 3/ 5/ 4	0.0		Approximate water table 30.0'
457.9			31								
456.9			32								



## Illinois Environmental Protection Agency

## Field Boring Log

Page 3 of 3Site File No. 1790600011 County TazewellBoring No. MW-2A Monitor Well No. MW-2A

Elev.	DESCRIPTION	Graphic Log	Depth in feet	SAMPLES						Personnel	REMARKS
				Sample No.	Sample Type	Sample Recovery (%)	Pocket Penetrometer (tsf)	N Values (Blows)	OVA or PID readings (ppm)	G - Charlie DeWol D - Roger Burton H - T. Bartholomew H -	
455.9	TD = 37		33								
454.9			34								
453.9			35								
452.9			36								
451.9			37								



# Illinois Environmental Protection Agency

## Field Boring Log

Page 1 of 3

Site File No. 1790600011 County Tazewell

Boring No. MW-3 Monitor Well No. MW-3

Site File Name Safety-Kleen Corp., Pekin Service Center, Pekin, IL

Surface Elev. 495.3 Completion Depth 43.0

ed. ID. No. ILD 093 862 811

Auger Depth 42.0 Rotary Depth       

Quadrangle Pekin Sec. 15 T. 24N R. 5E

Date: Start 8/16/94 Finish 8/16/94

UTM Coord. N. 4489750.00 E. 274500.00

Boring Location 45 ft E of UST basin, 15 ft W of fence

Drilling Equipment Diedrich D-120

Elev.	DESCRIPTION	Graphic Log	Depth in feet	SAMPLES						Personnel
				Sample No.	Sample Type	Sample Recovery (%)	Pocket Penetrometer (tsf)	N Values (Blows)	OVA or PID readings (ppm)	G - Charlie DeWolf D - Roger Burton H - T. Bartholomew H -
										REMARKS
	Surface is gravel cover								3.2	Background on PID 0-7 ppm.
494.3	0.0-3.0 SILT, CLAY LOAM (ML/OL); Black silt and clay loam. Brittle, dry to moist.		1			4				
493.3			2							
492.3			3							
491.3	4.0-5.0 POORLY GRADED SAND (SP); Sand, fine red, very little silt.		4							
490.3	5.0-10.0 POORLY GRADED SAND (SP); Sand, fine, red, primarily quartz. Very little silt, well sorted.		5			100		2/ 1/ 1/ 2	4.3	
489.3			6							
488.3			7							
487.3			8							
486.3			9							
485.3	10.0-15.0 WELL GRADED SAND/GRAVEL (SW/GW); Coarse sand and gravel with abundant lithic fragments. tan. Moist to wet.		10			100		2/ 2/ 3/ 4	4.3	
484.3			11							
483.3			12							
482.3			13							
481.3			14							
480.3			15							



## Illinois Environmental Protection Agency

## Field Boring Log

Page 2 of 3

Site File No. 1790600011

County Tazewell

Boring No. MW-3

Monitor Well No. MW-3

		SAMPLES						Personnel			
		Sample No.	Sample Type	Sample Recovery (%)	Pocket Penetrometer (tsf)	N Values (Blows)	OVA or PID readings (ppm)	G - Charlie DeWol	D - Roger Burton	H - T. Bartholomew	H -
Elev.	DESCRIPTION	Graphic Log	Depth in feet					REMARKS			
	15-20 SAND (SW/SP); Coarse tan sand with abundant lithic fragments. dry.				100		4/5/7/8	6.0			
479.3			16								
478.3			17								
477.3			18								
476.3			19								
475.3	20-25 WELL GRADED SAND (SW); Sand, coarse to medium, tan, as above.		20		100	2/3/5/5	6.3				
474.3			21								
473.3			22								
472.3			23								
471.3			24								
470.3	25-30 SAND (SW/SP); Interbedded fine-medium tan sand, well sorted, predominant 25-26 feet bgs, and coarse brown to tan sand with abundant gravel 26-27.		25		100	4/8/12/12	1.3				
469.3			26								
468.3			27								
467.3			28								
466.3			29								
465.3	30-35 WELL GRADED SAND/SILTY GRAVEL (SW/GM); Brown silty sand and gravel. gravel abundant up to one cm in size. Dry 30-32.		30		100	5/7/8/8	5.0				
464.3			31								
463.3			32								



## Illinois Environmental Protection Agency

## Field Boring Log

Page 3 of 3Site File No. 1790600011County TazewellBoring No. MW-3Monitor Well No. MW-3

Elev.	DESCRIPTION	Graphic Log	Depth in feet	SAMPLES						Personnel	REMARKS
				Sample No.	Sample Type	Sample Recovery (%)	Pocket Penetrometer (tsf)	N Values (Blows)	OVA or PID readings (ppm)	G - Charlie DeWolf D - Roger Burton H - T. Bartholomew H -	
462.3	35-37 WELL SORTED SAND/ SILTY GRAVEL (SW/GM); As above, less gravel than above, wet. Sampler dripping.		33								
461.3			34								
460.3			35			100		NA	4.3		
459.3			36								
458.3			37								
457.3			38								
456.3			39			100		2/ 6/ 8/ 12	0.0		
455.3			40								
454.3			41								
			TD = 41								

Approximate water table  
37.0'



## Illinois Environmental Protection Agency

## Field Boring Log

Page 1 of 3Site File No. 1790600011 County TazewellBoring No. MW-4 Monitor Well No. MW-4Site File Name Safety-Kleen Corp., Pekin Service Center, Pekin, ILSurface Elev. 494.2 Completion Depth 43.0Fed. ID. No. ILD 093 862 811Auger Depth 43 Rotary Depth Quadrangle Pekin Sec. 15 T. 24N R. 5EDate: Start 8/16/94 Finish 8/17/94UTM Coord. N. 4489750.00 E. 274500.00Boring Location NW corner of old office/warehouseDrilling Equipment Diedrich D-120

Elev.	DESCRIPTION	Graphic Log	Depth in feet	SAMPLES						Personnel
				Sample No.	Sample Type	Sample Recovery (%)	Pocket Penetrometer (tsf)	N Values (Blows)	OVA or PID readings (ppm)	G - Charlie DeWolf D - Roger Burton H - T. Bartholomew H -
										REMARKS
	Surface is grass									
493.2	0.0-4.0 SILT (ML) brown silt, dry, stiff to crumbly.		1							
492.2			2							
491.2			3							
490.2	4.0-5.0 POORLY GRADED SAND (SP); Fine red sand.		4							
489.2	5.0-10.0 POORLY GRADED SAND (SP); Fine to medium red to brown sand with clay (CL) interval (semi-soft, and silty, brown) between 6.5 and 7.0 feet.		5			100		1/ 2/ 1/ 2	0.0	
488.2			6							
487.2			7							
486.2			8							
485.2			9							
484.2	10.0-15.0 WELL GRADED SAND (SW); Coarse to medium tan sand with abundant lithic fragments		10			100		4/ 6/ 7/ 12	0.0	
483.2			11							
482.2			12							
481.2			13							
480.2			14							
479.2			15							



## Illinois Environmental Protection Agency

## Field Boring Log

Page 2 of 3

Site File No. 1790600011

County Tazewell

Boring No. MW-4

Monitor Well No. MW-4

Elev.	DESCRIPTION	Graphic Log	Depth in feet	SAMPLES						Personnel	REMARKS
				Sample No.	Sample Type	Sample Recovery (%)	Pocket Penetrometer (tsf)	N Values (Blows)	OVA or PID readings (ppm)	G - Charlie DeWolf D - Roger Burton H - T. Bartholomew H -	
478.2	15.0-20.0 SAND (SW) As above		16			100		3/ 5/ 6/ 7	0.0		
477.2			17								
476.2			18								
475.2			19								
474.2	20.0-25.0 SAND (SW); As above		20			100		3/ 4/ 8/ 10	0.0		
473.2			21								
472.2			22								
471.2			23								
470.2			24								
469.2	25.0-30.0 WELL GRADED SAND AND GRAVEL (SW/GW) Coarse sand with some medium grains, and brown slightly silty gravel.		25			100		4/ 8/ 8/ 8	NA		
468.2			26								
467.2			27								
466.2			28								
465.2			29								
464.2	30.0-35.0 WELL GRADED SAND (SW); Medium to coarse tan to brown sand.		30			100		5/ 5/ 6/ 7	0.0		
463.2			31								
462.2			32								





Site File No. 1790600011 County Tazewell Boring No. MW-5 Monitor Well No. MW-5  
Site File Name Safety-Kleen Corp., Pekin Service Center, Pekin, IL Surface Elev. 489.8 Completion Depth 38.0  
Ed. ID. No. ILD 093 862 811 Auger Depth 37 Rotary Depth

Quadrangle Pekin Sec. 15 T. 24N R. 5E Date: Start 8/17/94 Finish 8/18/94

UTM Coord. N. 4489750.00 E. 274500.00

Boring Location SW corner of sign island, bottom of hill

**Drilling Equipment      Diedrich D-120**

SAMPLES						Personnel
Sample No.	Sample Type	Sample Recovery (%)	Pocket Penetrometer (tsf)	N Values (Blows)	OVA or PID readings (ppm)	G - Charlie DeWolf D - Roger Burton H - T. Bartholomew H -
						REMARKS
		100		3/ 4/ 7/ 10	0.0	TOV 0.0 on cuttings.



## Illinois Environmental Protection Agency

## Field Boring Log

Page 2 of 3

Site File No. 1790600011

County Tazewell

Boring No. MW-5

Monitor Well No. MW-5

Elev.	DESCRIPTION	Graphic Log	Depth in feet	SAMPLES						Personnel	REMARKS
				Sample No.	Sample Type	Sample Recovery (%)	Pocket Penetrometer (tsf)	N Values (Blows)	OVA or PID readings (ppm)	G - Charlie DeWo D - Roger Burton H - T. Bartholomaw H -	
473.8	15.0-20.0 POORLY GRADED SAND (SP); Sand, fine tan, well sorted 15-17, medium to coarse 17-20.		16			100		3/ 4/ 10/ 14	0.0		
472.8			17								
471.8			18								
470.8			19								
469.8	20.0-25.0 WELL GRADED SAND WITH GRAVEL (SW); Coarse tan to brown sand with gravel, some fine sand and silt, poorly sorted.		20			100		4/ 7/ 7/ 8	0.0		
468.8			21								
467.8			22								
466.8			23								
465.8	25.0-30.0 WELL GRADED SAND WITH GRAVEL (SW/GW); Brown to tan coarse sand with minor gravel. As above, with less silt/fines.		24								
464.8			25			100		5/ 8/ 10/ 6	0.0		
463.8			26								
462.8			27								
461.8	30.0-35.0 WELL GRADED SAND WITH GRAVEL (SW); Brown to tan coarse sand with minor gravel as above, saturated.		28								
460.8			29								
459.8			30			100		4/ 6/ 7/ 8	0.0		Approximate water t 30.0'
458.8			31								
457.8			32								

Site File No. 1790600011

County Tazewell

Boring No. MW-5

Monitor Well No. MW-5

Elev.	DESCRIPTION	Graphic Log	Depth in feet	SAMPLES							Personnel
				Sample No.	Sample Type	Sample Recovery (%)	Pocket Penetrometer (test)	N Values (Blows)	OVA or PID readings (ppm)	REMARKS	G - Charlie DeWolf D - Roger Burton H - T. Bartholomew H -
456.8	TD = 37		33								
455.8			34								
454.8			35								
453.8			36								
452.8			37								



Elev.	DESCRIPTION	Gravel Log	Depth in feet	Sample	Sample	Sample Recovery	Pocket Penet.	N Val	OVA reading	REMARKS
492.0	Grass on surface		1							
491.0	0.5 - 3.0 SILT (ML) Brown to dark brown, with some fine red sand.		2							
490.0	3.0-5.0 POORLY GRADED SAND (SP); Sand, fine red, slightly silty.		3			100		2/ 1/ 1/ 2	3.0	
489.0			4							
488.0	5.0-10.0 WELL GRADED SAND (SW); Sand, medium (mostly) to coarse, tan with minor gravel. No silt present. Arkosic, dry.		5							
487.0			6							
486.0			7							
485.0			8			100		2/ 3/ 4/ 4	0.9	
484.0			9							
483.0	10.0-15.0 WELL GRADED SAND WITH GRAVEL (SW); Sand, medium to coarse tan sand with minor gravel.		10							
482.0			11							
481.0			12							
480.0			13			100		4/ 7/ 10/ 12	2.0	
479.0			14							
478.0			15							



Site File No. 1790600011

County Tazewell

Boring No. BH-2

Monitor Well No.

Elev.	DESCRIPTION	Graphic Log	Depth in feet	SAMPLES						Personnel	REMARKS
				Sample No.	Sample Type	Sample Recovery (%)	Pocket Penetrometer (tsf)	N Values (Blows)	OVA or PID readings (ppm)	G - Charlie DeWolf D - Roger Burton H - T. Bartholomew H -	
477.0	15.0-20.0 POORLY GRADED SAND (SP); Sand, fine, tan, well sorted, slightly moist. Quartz and feldspar predominate with rare lithic fragments.		16								
476.0			17								
475.0			18			100		4/ 7/ 10/ 12	2.0		
474.0			19								
473.0	20.0-25.0 WELL GRADED SAND (SW) Coarse to medium sand, tan, subangular to subrounded with minor gravel. Slightly arkosic, some silt.		20								
472.0			21								
471.0			22								
470.0			23			100		6/ 7/ 7/ 8	0.0		
469.0	25.0-30.0 WELL GRADED SAND (SW) Sand, alternating coarse medium tan to brown sand and fine tan sand. Thickest fine tan sand interbed approx 2 inches at 29 ft.		24								
468.0			25								
467.0			26								
466.0			27								
465.0	30.0-35.0 WELL GRADED SAND/ SILTY GRAVEL (SW/GM) Sand, coarse, tan to brown with minor gravel and silt. Brown and saturated 34-35 ft. Gray and saturated 35-36 ft.		28			100		4/ 8/ 12/ 16	0.9		
464.0			29								
463.0			30								
462.0			31								
461.0			32								



## Illinois Environmental Protection Agency

## Field Boring Log

Page 3 of 3Site File No. 1790600011 County TazewellBoring No. BH-2 Monitor Well No. \_\_\_\_\_

Elev.	DESCRIPTION	Graphic Log	Depth in feet	SAMPLES						Personnel	REMARKS
				Sample No.	Sample Type	Sample Recovery (%)	Pocket Penetrometer (tsf)	N Values (Blows)	OVA or PID readings (ppm)	G - Charlie DeWol D - Roger Burton H - T. Bartholomew H -	
460.0			33			100		2/ 2/ 7/ 9	292		
459.0			34								
458.0			35							Approximate water table 35.0'	
457.0			36								

APPENDIX C-3  
WELL COMPLETION REPORTS







## Illinois Environmental Protection Agency

## Well Completion Report

Site #: \_\_\_\_\_ County Tazewell Well # MW-1Site Name: Safety-Kleen Corp., Pekin Service Center, Pekin, IL Grid Coordinate: Northing 4489750.0 Easting: 274500.0Drilling Contractor: Midwest Engineering Services Date Drilled Start: 8-15-94Driller: Roger Burton Geologist: Charlie DeWolf Date Completed: 8-15-94Drilling Method: Hollow Stem Auger Drilling Fluids (type): None

## Annular Space Details

Type of Surface Seal: ConcreteType of Annular Sealant: Volclay bentonite grout

Amount of cement: # of bags \_\_\_\_\_ lbs. per bag \_\_\_\_\_

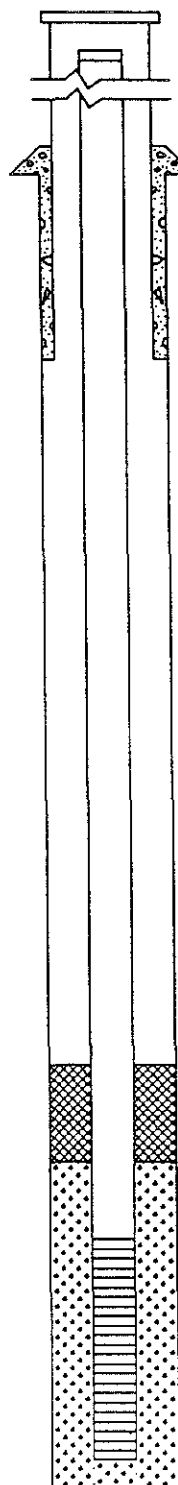
Amount of bentonite: # of bags 4 lbs. per bag 50Type of Bentonite Seal (Granular Pellet): Volclay-Pure  
Gold pelletsAmount of bentonite: # of Bags 2 lbs. per bag 50Type of Sand Pack: Red Flint #30 Filter SandSource of Sand: Chardon ConglomerateAmount of Sand: # of bags 9 lbs. per bag 50

## Well Construction Materials

	Stainless Steel Specify Type	Teflon Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint			Threaded	
Riser pipe above w.t.			Sch 40	
Riser pipe below w.t.			Sch 40	
Screen			Sch 40	
Coupling joint screen to riser			Threaded	
Protective casing	5 Ft Sq.			

## Elevations - 0.01 ft.

<u>-2.0</u>	<u>490.60</u>	MSL Top of Protective Casing
<u>-1.86</u>	<u>490.46</u>	MSL Top of Riser Pipe
<u>-1.86</u>	<u>490.46</u>	ft. Casing Stickup
<u>0.00</u>	<u>488.60</u>	MSL Ground Surface
<u>0</u>	<u>488.60</u>	ft. Top of annular sealant



<u>22.4</u>	<u>466.20</u>	ft. Top of Seal
<u>2.4</u>	<u>xxx</u>	ft. Total Seal Interval
<u>24.8</u>	<u>463.80</u>	ft. Top of Sand
<u>27.0</u>	<u>461.60</u>	ft. Top of Screen
<u>10 ft</u>	<u>xxx</u>	ft. Total Screen Interval
<u>37.0</u>	<u>451.60</u>	ft. Bottom of Screen
<u>37.0</u>	<u>451.60</u>	ft. Bottom of Borehole

## Measurements

to .01 (where applicable)

Riser pipe length	28.9 ft
Protective casing length	5 ft
Screen length	10 ft
Bottom of screen to end cap	0.4 ft
Top of screen to first joint	0.2 ft
Total length of casing	28.9 ft
Screen slot size	0.010
% of openings in screen	2.6
Diameter of borehole (in.)	8.5
ID of riser pipe (in.)	4 inch

Completed by: Burton/Bartholomew MES Surveyed by: Ron Klien Ill. registration #: #2480



# Illinois Environmental Protection Agency

## Well Completion Report

Site #: \_\_\_\_\_ County Tazewell Well # MW-2A

Site Name: Safety-Kleen Corp., Pekin Service Center, Pekin, IL Grid Coordinate: Northing 4489750.0 Easting: 274500.0

Drilling Contractor: Midwest Engineering Services Date Drilled Start: 8-17-94

Driller: Roger Burton Geologist: Charlie DeWolf Date Completed: 8-17-94

Drilling Method: Hollow Stem Auger Drilling Fluids (type): None

### Annular Space Details

Type of Surface Seal: Concrete

Type of Annular Sealant: Volclay bentonite grout

Amount of cement: # of bags \_\_\_\_\_ lbs. per bag \_\_\_\_\_

Amount of bentonite: # of bags 4 lbs. per bag 50

Type of Bentonite Seal (Granular Pellet): Volclay-Pure  
Gold pellets

Amount of bentonite: # of Bags 2.5 lbs. per bag 50

Type of Sand Pack: Red Flint #30 Filter Sand

Source of Sand: Chardon Conglomerate

Amount of Sand: # of bags 6 lbs. per bag 50

### Elevations - 0.01 ft.

0 488.90 MSL Top of Protective Casing  
0.16 488.74 MSL Top of Riser Pipe  
0.16 488.74 ft. Casing Stickup

0.00 488.90 MSL Ground Surface  
0 488.90 ft. Top of annular sealant

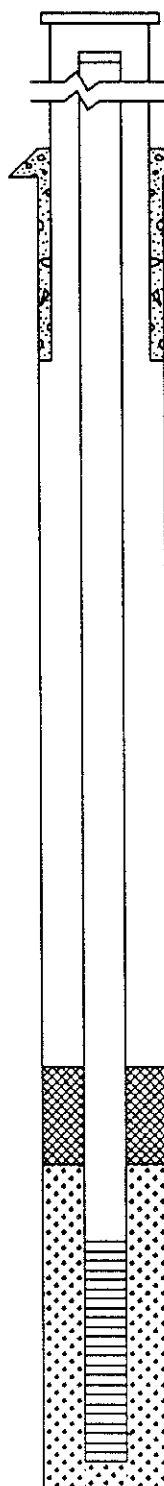
### Well Construction Materials

	Stainless Steel Specify Type	Teflon Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint			Threaded	
Riser pipe above w.t.			Sch 80	
Riser pipe below w.t.			Sch 80	
Screen			Sch 80	
Coupling joint screen to riser			Threaded	
Protective casing				10" Fl Alu

### Measurements

to .01 (where applicable)

Riser pipe length	26.3 ft
Protective casing length	0.83 ft
Screen length	10 ft
Bottom of screen to end cap	0.4 ft
Top of screen to first joint	0.2 ft
Total length of casing	36.4 ft
Screen slot size	0.010
% of openings in screen	2.6
Diameter of borehole (in.)	8.5
ID of riser pipe (in.)	4 inch



22.8 466.10 ft. Top of Seal

2.0 xxx ft. Total Seal Interval

24.8 464.10 ft. Top of Sand

26.5 462.40 ft. Top of Screen

10 ft xxx ft. Total Screen Interval

36.5 452.40 ft. Bottom of Screen

37.0 451.90 ft. Bottom of Borehole

Completed by: Burton/Bartholomew MES Surveyed by: Ron Klien Ill. registration #: #2480



## Illinois Environmental Protection Agency

## Well Completion Report

Site #: \_\_\_\_\_ County Tazewell Well # MW-3Site Name: Safety-Kleen Corp., Pekin Service Center, Pekin, IL Grid Coordinate: Northing 4489750.0 Easting: 274500.0Drilling Contractor: Midwest Engineering Services Date Drilled Start: 8-16-94Driller: Roger Burton Geologist: Charlie DeWolf Date Completed: 8-16-94Drilling Method: Hollow Stem Auger Drilling Fluids (type): None

## Annular Space Details

Type of Surface Seal: ConcreteType of Annular Sealant: Wyo-Ben Enviropug bentonite grout

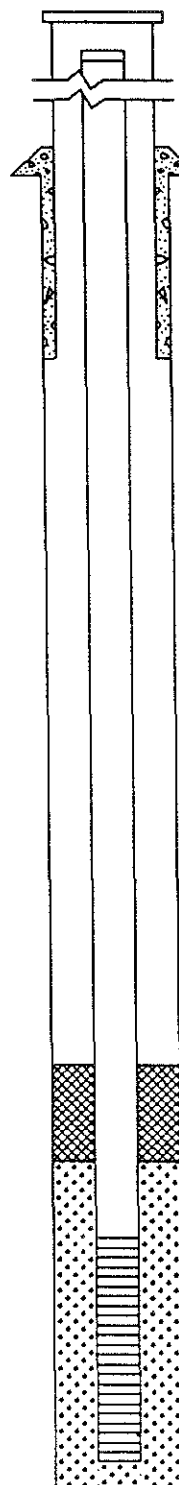
Amount of cement: # of bags \_\_\_\_\_ lbs. per bag \_\_\_\_\_

Amount of bentonite: # of bags 4 lbs. per bag 50Type of Bentonite Seal (Granular Pellet): Volclay-Pure  
Gold pelletsAmount of bentonite: # of Bags 2 lbs. per bag 50Type of Sand Pack: Red Flint #30 Filter SandSource of Sand: Chardon ConglomerateAmount of Sand: # of bags 6 lbs. per bag 50

## Elevations - 0.01 ft.

-2.1	<u>497.40</u>	MSL Top of Protective Casing
-2.0	<u>497.30</u>	MSL Top of Riser Pipe
-2.0	<u>497.30</u>	ft. Casing Stickup

0.00	<u>495.30</u>	MSL Ground Surface
0	<u>495.30</u>	ft. Top of annular sealant



26.5	<u>468.80</u>	ft. Top of Seal
2.1	<u>xxx</u>	ft. Total Seal Interval
28.6	<u>466.70</u>	ft. Top of Sand
30.2	<u>465.10</u>	ft. Top of Screen
10 ft	<u>xxx</u>	ft. Total Screen Interval
40.2	<u>455.10</u>	ft. Bottom of Screen
43.0	<u>452.30</u>	ft. Bottom of Borehole

## Well Construction Materials

	Stainless Steel Specify Type	Teflon Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint			Threaded	
Riser pipe above w.t.			Sch 80	
Riser pipe below w.t.			Sch 80	
Screen			Sch 80	
Coupling joint screen to riser			Threaded	
Protective casing	5 Ft Sq			

## Measurements

to .01 (where applicable)

Riser pipe length	32.2 ft
Protective casing length	5 ft
Screen length	10 ft
Bottom of screen to end cap	0.4 ft
Top of screen to first joint	0.2 ft
Total length of casing	42.3 ft
Screen slot size	0.010
% of openings in screen	2.6
Diameter of borehole (in.)	8.5
ID of riser pipe (in.)	4 inch

Completed by: Burton/Bartholomew MES Surveyed by: Ron Klien Ill. registration #: 32480



# Illinois Environmental Protection Agency

## Well Completion Report

Site #: \_\_\_\_\_ County Tazewell Well # MW-4

Site Name: Safety-Kleen Corp., Pekin Service Center, Pekin, IL Grid Coordinate: Northing 4489750.0 Easting: 274500.0

Drilling Contractor: Midwest Engineering Services Date Drilled Start: 8-16-94

Driller: Roger Burton Geologist: Charlie DeWolf Date Completed: 8-17-94

Drilling Method: Hollow Stem Auger Drilling Fluids (type): None

### Annular Space Details

Type of Surface Seal: Concrete

Type of Annular Sealant: Wyo-Ben Enviroplug bentonite grout

Amount of cement: # of bags \_\_\_\_\_ lbs. per bag \_\_\_\_\_

Amount of bentonite: # of bags 4 lbs. per bag 50

Type of Bentonite Seal (Granular Pellet): Volclay-Pure  
Gold pellets

Amount of bentonite: # of Bags 2.5 lbs. per bag 50

Type of Sand Pack: Red Flint #30 Filter Sand

Source of Sand: Chardon Conglomerate

Amount of Sand: # of bags 6 lbs. per bag 50

### Well Construction Materials

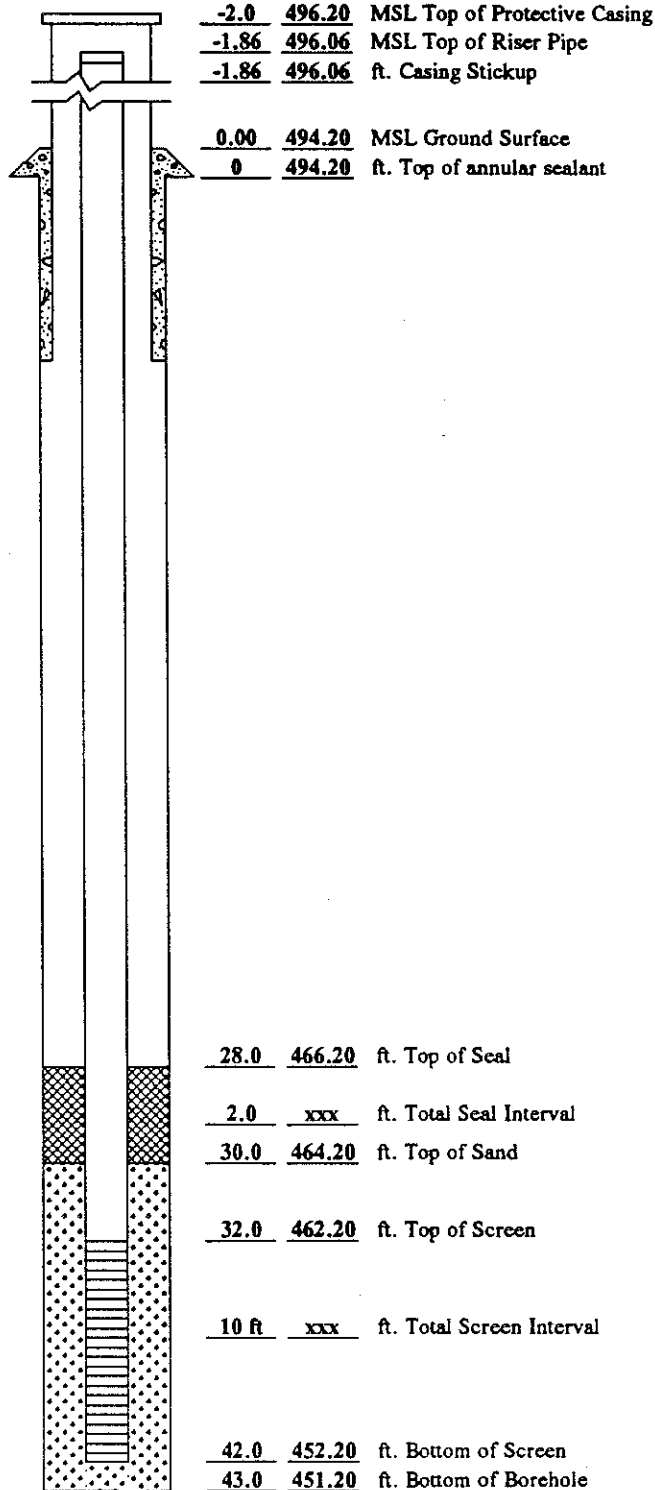
	Stainless Steel Specify Type	Teflon Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint			Threaded	
Riser pipe above w.t.			Sch 80	
Riser pipe below w.t.			Sch 80	
Screen			Sch 80	
Coupling joint screen to riser			Threaded	
Protective casing	5 Ft Sq			

### Measurements

to .01 (where applicable)

Riser pipe length	33.9 ft
Protective casing length	5 ft
Screen length	10 ft
Bottom of screen to end cap	0.4 ft
Top of screen to first joint	0.2 ft
Total length of casing	44.0 ft
Screen slot size	0.010
% of openings in screen	2.6
Diameter of borehole (in.)	8.5
ID of riser pipe (in.)	4 inch

### Elevations - 0.01 ft.



Completed by: Burton/Bartholomew MES Surveyed by: Ron Klien Ill. registration #: #2480



## Illinois Environmental Protection Agency

## Well Completion Report

Site #: \_\_\_\_\_ County Tazewell Well # MW-5Site Name: Safety-Kleen Corp., Pekin Service Center, Pekin, IL Grid Coordinate: Northing 4489750.0 Easting: 274500.0Drilling Contractor: Midwest Engineering Services Date Drilled Start: 8-17-94Driller: Roger Burton Geologist: Charlie DeWolf Date Completed: 8-18-94Drilling Method: Hollow Stem Auger Drilling Fluids (type): None

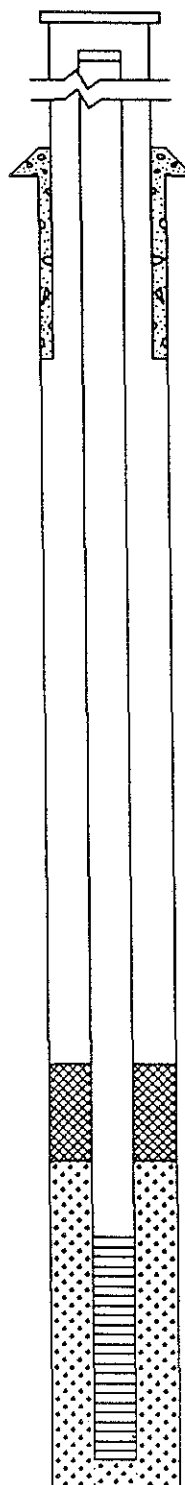
## Annular Space Details

Type of Surface Seal: ConcreteType of Annular Sealant: Wyo-Ben Enviroplug bentonite grout

Amount of cement: # of bags \_\_\_\_\_ lbs. per bag \_\_\_\_\_

Amount of bentonite: # of bags 4 lbs. per bag 50Type of Bentonite Seal (Granular Pellet): Volclay-Pure  
Gold pelletsAmount of bentonite: # of Bags 2 lbs. per bag 50Type of Sand Pack: Red Flint #30 Filter SandSource of Sand: Chardon ConglomerateAmount of Sand: # of bags 6 lbs. per bag 50

## Elevations - 0.01 ft.



-0.2	490.00	MSL Top of Protective Casing
-0.04	489.84	MSL Top of Riser Pipe
-0.04	489.84	ft. Casing Stickup

0.00	489.80	MSL Ground Surface
0.6	489.20	ft. Top of annular sealant

21.5	468.30	ft. Top of Seal
------	--------	-----------------

3.0	xxx	ft. Total Seal Interval
-----	-----	-------------------------

24.5	465.30	ft. Top of Sand
------	--------	-----------------

27.2	462.60	ft. Top of Screen
------	--------	-------------------

10 ft	xxx	ft. Total Screen Interval
-------	-----	---------------------------

37.2	452.60	ft. Bottom of Screen
------	--------	----------------------

38.0	451.80	ft. Bottom of Borehole
------	--------	------------------------

## Well Construction Materials

	Stainless Steel Specify Type	Teflon Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint			Threaded	
Riser pipe above w.t.			Sch 40	
Riser pipe below w.t.			Sch 40	
Screen			Sch 40	
Coupling joint screen to riser			Threaded	
Protective casing	10" Alum.			10" FI Alu

## Measurements

to .01 (where applicable)

Riser pipe length	27.2 ft
Protective casing length	0.83 ft
Screen length	10 ft
Bottom of screen to end cap	0.4 ft
Top of screen to first joint	0.2 ft
Total length of casing	37.3
Screen slot size	0.010
% of openings in screen	2.6
Diameter of borehole (in.)	8.5
ID of riser pipe (in.)	4 inch

Completed by: Burton/Bartholomew MES Surveyed by: Ron Klien Ill. registration #: #2480



APPENDIX C-4

IDPH WELL CONSTRUCTION REPORTS





White: 7 Pink Copies:  
1 Dept. of Public Health  
Yellow: Copy: Well Contractor  
Golden: Copy: Well Owner

## Well Construction Report

Monitoring 11  
MW-1 Pekin

THIS FORM MUST BE COMPLETED WITHIN 30 DAYS  
OF WELL COMPLETION AND SENT TO  
THE ILLINOIS DEPARTMENT OF PUBLIC HEALTH  
DIVISION OF ENVIRONMENTAL HEALTH  
525 WEST JEFFERSON STREET  
SPRINGFIELD, ILLINOIS 62761

### GEOLOGICAL AND WATER SURVEYS WELL RECORD

9. Driller Tracey Bartholomew License No. NA  
10. Well Site Address 14249 VFW Rd Pekin IL 61554  
11. Property Owner Safety-Kleen Corp Well No. MW-21  
12. Permit No. NA Date Issued NA  
13. Location: NW 1/4 of SW 1/4 Section 15 County Tazewell  
Sec. 15  
Twp. 24N  
Rge. 5W

1. Type of Well  
a. Bored ☒ Hole Diam. 10 in. Depth 37.0 ft  
Buried Slab: Yes ☐ No ☐  
b. Driven ☐ Drive Pipe Diam. ☐ in. Depth ☐ ft  
c. Drilled ☐ Finished in Drift ☐ In Rock ☐

d. Grout:

(KIND)	FROM (Ft.)	TO (Ft.)
VOLCLAY	0	22.4
Bentonite Pellets	22.4	24.8

2. Well furnishes water for human consumption? Yes ☐ No ☒  
3. Date well drilled 8/15/94  
4. Permanent pump installed? Yes ☐ Date ☐ No NA  
Manufacturer ☐ Type ☐  
Location ☐  
Capacity ☐ gpm. Depth of setting ☐ ft.  
5. Well top sealed? Yes ☒ No ☐ Type GROUT  
6. Pitless adapter installed? Yes ☐ No ☒ NA  
Manufacturer ☐ Model No. ☐  
How attached to casing? ☐  
7. Well disinfected? Yes ☐ No ☒ NA  
8. Pump and equipment disinfected Yes ☐ No ☒ NA

#### IMPORTANT NOTICE

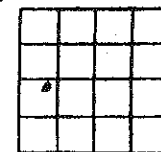
This State Agency is requesting disclosure of information that is necessary to accomplish the statutory purpose as outlined under Public Act 85-0863. Disclosure of this information is mandatory. This form has been approved by the Forms Management Center.

PRESS FIRMLY WITH BLACK PEN OR TYPE  
Do Not Use Felt Pen

14. Water from MANIC TERRACE DEPOSITS at depth 30.0 ft

Diam.(in)	Kind and Weight	From (ft)	To (ft)
4" ID	RISER SCH 40 F/J PVC	1.86 ABOVE	27.0
4" ID	SCREEN SCH 40 F/J PVC	27.0	37.0

Show location  
in section  
plat



16. Screen: Diam. 4 in, Length 120 in, Slot Size 0.010"  
17. Size hole below casing N/A in. 18. Ground Elev. 488.6 ft msl.  
19. Static level 29.0 ft below casing top which is 1.86 ft. above ground level. Pumping level N/A ft, pumping gpm for N/A hours.

20. Earth Materials Passed Through	Depth of Top	Depth of Bottom
SILT	0	3
SAND	3	37

Continue on separate sheet if necessary.

Signed

Mark P. Wolf

Date

9/2/94

White & Pink Copies:  
Ill. Dept. of Public Health  
Yellow Copy: Well Contractor  
Golden Copy: Well Owner

## Well Construction Report

Monitoring Well MW-2A  
Pekin

THIS FORM MUST BE COMPLETED WITHIN 30 DAYS  
OF WELL COMPLETION AND SENT TO  
THE ILLINOIS DEPARTMENT OF PUBLIC HEALTH  
DIVISION OF ENVIRONMENTAL HEALTH  
525 WEST JEFFERSON STREET  
SPRINGFIELD, ILLINOIS 62761

1. Type of Well

a. Bored ☒ Hole Diam. 10 in. Depth 36.6 ft  
Buried Slab: Yes ☐ No ☐  
b. Driven ☐ Drive Pipe Diam. ☐ in. Depth ☐ ft  
c. Drilled ☐ Finished in Drift ☐ In Rock ☐  
d. Grout:

(KIND)	FROM (Ft.)	TO (Ft.)
VOLCLAY	0	22.8
Bentonite Pellets	22.8	24.8

2. Well furnishes water for human consumption? Yes ☐ No ☒  
3. Date well drilled 8/17/94  
4. Permanent pump installed? Yes ☐ Date ☐ No ☒ NA  
Manufacturer ☐ Type ☐  
Location ☐  
Capacity ☐ gpm. Depth of setting ☐ ft.  
5. Well top sealed? Yes ☒ No ☐ Type GROUT / Concrete  
6. Pitless adapter installed? Yes ☐ No ☒ NA  
Manufacturer ☐ Model No. ☐  
How attached to casing? ☐  
7. Well disinfected? Yes ☐ No ☒ NA  
8. Pump and equipment disinfected Yes ☐ No ☒ NA

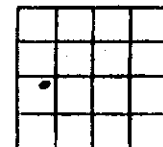
### IMPORTANT NOTICE

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PRESS FIRMLY WITH BLACK PEN OR TYPE  
Do Not Use Felt Pen

### GEOLOGICAL AND WATER SURVEYS WELL RECORD

9. Driller Tracey Bartholomew License No. NA  
10. Well Site Address 14249 VFW Rd Pekin IL 61554  
11. Property Owner Safety-Kleen Corp Well No. MW-2A  
12. Permit No. NA Date Issued NA  
13. Location: NW 1/4 of SW 1/4, Section 15 County TAZEWELL  
Sec. 15  
Twp. 24N  
Rge. 5W



Show location  
in section  
plat

14. Water from <u>MANITO TERRACE DEPOSITS</u> at depth <u>30</u> ft		15. Casing and Liner Pipe to <u>36.6</u> ft	
Diam.(in)	Kind and Weight	From (ft)	To (ft)
4" ID	RISER SCH 80 F/I PVC		26.5
4" ID	SCREEN SCH 80 F/I PVC	26.5	36.5

16. Screen: Diam. 4 in, Length 120 in, Slot Size 0.010 in  
17. Size hole below casing NA in. 18. Ground Elev. 488.9 ft msl.  
19. Static level 29.4 ft below casing top which is 0.16 ft. above ground level. Pumping level NA ft, pumping gpm for NA hours.

20. Earth Materials Passed Through	Depth of Top	Depth of Bottom
SAND	0	36.6

Continue on separate sheet if necessary.

Signed Shah P J Wolf

9/2/94

Wh: 1 Pink Copies:  
1 rpt. of Public Health  
Yellow Copy: Well Contractor  
Golden Copy: Well Owner

## Well Construction Report

Monitoring W

W-3

Pekin

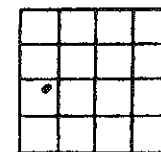
THIS FORM MUST BE COMPLETED WITHIN 30 DAYS  
OF WELL COMPLETION AND SENT TO  
THE ILLINOIS DEPARTMENT OF PUBLIC HEALTH  
DIVISION OF ENVIRONMENTAL HEALTH  
525 WEST JEFFERSON STREET  
SPRINGFIELD, ILLINOIS 62761

### GEOLOGICAL AND WATER SURVEYS WELL RECORD

9. Driller T. Bartholomew/Midwest Eng. License No. NA  
10. Well Site Address 14249 VFW Rd Pekin IL 61554  
11. Property Owner Safety-Kleen Corp Well No. MW-3  
12. Permit No. NA Date Issued NA  
13. Location: County TAZEWELL

NW 1/4 of SW 1/4, Section 15

Sec. 15  
Twp. 24N  
Rge. 5W



#### 1. Type of Well

a. Bored ☒ Hole Diam. 10 in. Depth 40.3 ft  
Buried Slab: Yes ☐ No ☐

b. Driven ☐ Drive Pipe Diam. ☐ in. Depth ☐ ft

c. Drilled ☐ Finished in Drift ☐ In Rock ☐

#### d. Grout:

(KIND)	FROM (Ft.)	TO (Ft.)
VOLCLAY	0	26.5
Portland Pellets	26.5	28.0

2. Well furnishes water for human consumption? Yes ☐ No ☒  
3. Date well drilled 8/16/94  
4. Permanent pump installed? Yes ☐ Date ☐ No ☒ NA  
Manufacturer ☐ Type ☐  
Location ☐  
Capacity ☐ gpm. Depth of setting ☐ ft.  
5. Well top sealed? Yes ☒ No ☐ Type Grout  
6. Pitless adapter installed? Yes ☐ No ☒ NA  
Manufacturer ☐ Model No. ☐  
How attached to casing? ☐  
7. Well disinfected? Yes ☐ No ☒ NA  
8. Pump and equipment disinfected Yes ☐ No ☒ NA

#### IMPORTANT NOTICE

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PRESS FIRMLY WITH BLACK PEN OR TYPE

Do Not Use Felt Pen

14. Water from <u>MANITO TERRACE DEPOSITS</u> at depth <u>35</u> ft		to <u>40.3</u> ft	
Diam. (in)	Kind and Weight	From (ft)	To (ft)
4"	RISER SCH 80 F/I PVC	2.0 ABOVE GD	30.2
4"	SCREEN SCH 80 F/I PVC	30.2	40.2

Show location in section plat

16. Screen: Diam. 4 in, Length 120 in, Slot Size 0.010"  
17. Size hole below casing NA in. 18. Ground Elev. 496.3 ft msl.  
19. Static level 335 ft below casing top which is 2.0 ft. above ground level. Pumping level NA ft, pumping gpm for NA hours.

20. Earth Materials Passed Through	Depth of Top	Depth of Bottom
SILT / LOAM	0	4
SAND	4	40.3

Continue on separate sheet if necessary.

Signed Shirley P. Dwyer

Date 9/2/94

White & Pink Copies:  
 Ill. Dept. of Public Health  
 Yellow Copy: Well Contractor  
 Golden Copy: Well Owner

Monitoring Well File 44-02  
 MW-4  
 Pekin

## Well Construction Report

THIS FORM MUST BE COMPLETED WITHIN 30 DAYS  
 OF WELL COMPLETION AND SENT TO  
 THE ILLINOIS DEPARTMENT OF PUBLIC HEALTH  
 DIVISION OF ENVIRONMENTAL HEALTH  
 525 WEST JEFFERSON STREET  
 SPRINGFIELD, ILLINOIS 62761

### GEOLOGICAL AND WATER SURVEYS WELL RECORD

#### 1. Type of Well

a. Bored ☒ Hole Diam. 10 in. Depth 42.1 ft

Buried Slab: Yes ☐ No ☐

b. Driven ☐ Drive Pipe Diam. ☐ in. Depth ☐ ft

c. Drilled ☐ Finished in Drift ☐ In Rock ☐

#### d. Grout:

(KIND)	FROM (Ft.)	TO (Ft.)
VOLCLAY	0	28.0
Bentonite Pellets	28.0	30.0

2. Well furnishes water for human consumption? Yes ☐ No ☒

3. Date well drilled 8/16/94

4. Permanent pump installed? Yes ☐ Date ☐ No ☒ NA

Manufacturer ☐ Type ☐

Location ☐

Capacity ☐ gpm. Depth of setting ☐ ft.

5. Well top sealed? Yes ☒ No ☐ Type GROUT

6. Pitless adapter installed? Yes ☐ No ☒ NA

Manufacturer ☐ Model No. ☐

How attached to casing? ☐

7. Well disinfected? Yes ☐ No ☒ NA

8. Pump and equipment disinfected Yes ☐ No ☒ NA

#### IMPORTANT NOTICE

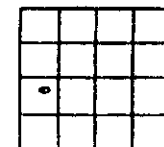
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PRESS FIRMLY WITH BLACK PEN OR TYPE

Do Not Use Felt Pen

9. Driller T. Bartholomew / Midwest Eng. Ser. License No. NA  
 10. Well Site Address 14249 VFW Rd, Pekin IL 61554  
 11. Property Owner Safety-Kleen Corp. Well No. MW-4  
 12. Permit No. NA Date Issued NA  
 13. Location: NW 1/4 of SW 1/4, Section 15 County TAZE Well

Sec. 15  
 Twp. 24N  
 Rge. SW



Show location in section plat

14. Water from Marion Terrace Deposits at depth 85 ft

15. Casing and Liner Pipe to 42.1 ft

Diam. (in)	Kind and Weight	From (ft)	To (ft)
4"	RISER SCH 80 F/T PVC	1.86 ABOVE GD	32.0
4"	SCREEN SCH 80 F/T PVC	32.0	42.0

16. Screen: Diam. 4 in, Length 120 in, Slot Size 0.010"

17. Size hole below casing NA in. 18. Ground Elev. 494.2 ft msl.

19. Static level 36.6 ft below casing top which is 1.86 ft. above ground level. Pumping level NA ft, pumping gpm for NA hours.

20. Earth Materials Passed Through	Depth of Top	Depth of Bottom
BROWN SILT	0	4
SAND	4	42.1

Continue on separate sheet if necessary.

Signed Shah P. J. Wolf 0 9/2/94

# Well Construction Report

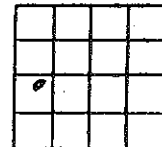
Monitoring 11  
 1W-5  
 Pekin

THIS FORM MUST BE COMPLETED WITHIN 30 DAYS  
 OF WELL COMPLETION AND SENT TO  
 THE ILLINOIS DEPARTMENT OF PUBLIC HEALTH  
 DIVISION OF ENVIRONMENTAL HEALTH  
 525 WEST JEFFERSON STREET  
 SPRINGFIELD, ILLINOIS 62761

## GEOLOGICAL AND WATER SURVEYS WELL RECORD

9. Driller T. Bartholomew / Midwest Eng. License No. NA  
 10. Well Site Address 14249 VFW Rd Pekin IL 61554  
 11. Property Owner Safety-Kleen Corp Well No. MW-5  
 12. Permit No. NA Date Issued NA  
 13. Location: NW 1/4 of SW 1/4, Section 15 County TAZEWELL

Sec. 15  
 Twp. 24N  
 Rge. 5W



1. Type of Well  
 a. Bored ☒ Hole Diam. 10 in. Depth 37.3 ft  
 Buried Slab: Yes ☐ No ☐  
 b. Driven ☐ Drive Pipe Diam. ☐ in. Depth ☐ ft  
 c. Drilled ☐ Finished in Drift ☐ In Rock ☐  
 d. Grout:

(KIND)	FROM (Ft.)	TO (Ft.)
VOLCLAY	0	21.5
Barbicide Pellets	21.5	24.5

2. Well furnishes water for human consumption? Yes ☐ No ☒ NA  
 3. Date well drilled 8/17/94  
 4. Permanent pump installed? Yes ☐ Date ☐ No ☒ NA  
 Manufacturer ☐ Type ☐  
 Location ☐  
 Capacity ☐ gpm. Depth of setting ☐ ft.  
 5. Well top sealed? Yes ☒ No ☐ Type GROUT  
 6. Pitless adapter installed? Yes ☐ No ☒ NA  
 Manufacturer ☐ Model No. ☐  
 How attached to casing? ☐  
 7. Well disinfected? Yes ☐ No ☒ NA  
 8. Pump and equipment disinfected Yes ☐ No ☒ NA

### IMPORTANT NOTICE

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PRESS FIRMLY WITH BLACK PEN OR TYPE  
 Do Not Use Felt Pen

14. Water from Marino Terrace Deposits at depth 30 ft

15. Casing and Liner Pipe		to <u>37.3</u> ft	
Diam. (in)	Kind and Weight	From (ft)	To (ft)
4"	RISER SCH 40 F/S PVC	0	27.2
4"	SCREEN SCH 40 F/S PVC	27.2	37.2

Show location in section plat

16. Screen: Diam. 4" in, Length 120 in, Slot Size 0.010"  
 17. Size hole below casing NA in. 18. Ground Elev. 489.8 ft msl.  
 19. Static level 30.4 ft below casing top which is 0.4 ft. above ground level. Pumping level NA ft, pumping gpm for NA hours.

20. Earth Materials Passed Through	Depth of Top	Depth of Bottom
SAND	0	37.3

Continue on separate sheet if necessary.

Signed [Signature] Date 9/2/94



APPENDIX D

SOIL QUALITY DATA LABORATORY ANALYTICAL REPORTS  
QA/QC REPORTS  
AND CHAIN-OF-CUSTODY DOCUMENTS  
EXTENT OF DEGRADATION INVESTIGATION  
SAFETY-KLEEN CORP. SERVICE CENTER  
PEKIN, ILLINOIS









File  
44-01  
44-02

August 31, 1994

Mr. Jack Bedessem  
TriHydro Corporation  
920 Sheridan  
Laramie, WY 82070

Re: SK Lab Project #94-053  
Project ID Name: SK Pekin, IL

Dear Jack:

Enclosed please find the revised analytical results for samples received by SK Environmental Laboratory on 8/12/94 and 8/15/94.

A formal Quality Control/Quality Assurance program is maintained by Safety-Kleen, which is designed to meet or exceed the EPA requirements. Analytical work for this project met QA/QC criteria unless otherwise stated.

If you have any questions concerning this analysis, or if we can be of further assistance, please call Matt Schweik at 312-825-7387.

Sincerely,

Mark A. Hartwig  
Environmental Lab Manager

MAH:jt

cc: Gary Long  
Tom Nissen

Allan A. Manteuffel Technical Center

P.O. Box 92050  
Elk Grove Village, IL  
60009-2050

12555 W. Old Higgins Rd.  
Elk Grove Village, IL 60007  
Telephone: 312/694-2700  
Fax: 312/825-7850

Project ID #: 44-02

Metals

Page 1 of 9

Project ID Name: SK - Pekin

SK Lab Project #: 94-053

Date Reported: 12/2/94

**ANALYTICAL RESULTS****Metals in TCLP Leachate**

Work Order #	01	02	03	04	05	
Collector's Sample #	EOD-1 (12-14)	EOD-3 (10-12)	EOD-3 (32-34)	EOD-4 (10-12)	EOD-4 (17.5-19.5)	
Date Sampled	8/9/94	8/9/94	8/9/94	8/10/94	8/10/94	
Date Leached	8/17/94	8/17/94	8/17/94	8/17/94	8/17/94	
Date Analyzed (EPA Method 7060)	8/20/94	8/20/94	8/20/94	8/20/94	8/20/94	
Date Analyzed (EPA Method 7131)	8/22/94	8/22/94	8/22/94	8/22/94	8/27/94	
Date Analyzed (EPA Method 7191)	8/19/94	8/19/94	8/19/94	8/19/94	8/19/94	
Date Analyzed (EPA Method 7421)	8/25/94	8/25/94	8/25/94	8/25/94	8/25/94	
Analyte	EPA Method	Reporting Limit mg/L	Concentration mg/L			
Arsenic	7060	0.05	<0.05	<0.05	<0.05	<0.05
Cadmium	7131	0.005	<0.005	0.007	<0.005	0.0084
Chromium	7191	0.1	<0.1	<0.1	<0.1	<0.1
Lead	7421	0.0075	<0.0075	0.016	<0.0075	<0.0075

Work Order #	06	07	30	31	32
Collector's Sample #	EOD-5 (13-15)	EOD-5 (32-34)	EOD-6 (0.5-2.5)	EOD-6 (15.5-17.5)	EOD-6 (34-36)
Date Sampled	8/10/94	8/10/94	8/11/94	8/11/94	8/11/94
Date Leached	8/17/94	8/17/94	8/19/94	8/19/94	8/20/94
Date Analyzed (EPA Method 7060)	8/20/94	8/20/94	8/24/94	8/24/94	8/27/94
Date Analyzed (EPA Method 7131)	8/22/94	8/22/94	8/24/94	8/24/94	8/27/94
Date Analyzed (EPA Method 7191)	8/19/94	8/19/94	8/24/94	8/24/94	8/29/94
Date Analyzed (EPA Method 7421)	8/25/94	8/25/94	8/27/94	8/30/94	8/25/94
Analyte	EPA Method	Reporting Limit mg/L	Concentration mg/L		
Arsenic	7060	0.05	<0.05	<0.05	<0.05
Cadmium	7131	0.005	<0.005	<0.005	<0.005
Chromium	7191	0.10	<0.10	<0.10	<0.10
Lead	7421	0.0075	<0.0075	<0.0075	<0.0075

**ANALYTICAL REVIEW / DATE:**

Project ID #: 44-02

Metals

Page 2 of 9

Project ID Name: SK - Pekin

SK Lab Project #: 94-053

Date Reported: 12/2/94

**ANALYTICAL RESULTS****Metals in TCLP Leachate**

Work Order #	33	34	35	36	37
Collector's Sample #	EOD-7 (13-15)	EOD-7 (34 - 36)	EOD-8 (13-15)	EOD-8 (34-36)	EOD-9 (34-36)
Date Sampled	8/11/94	8/11/94	8/11/94	8/11/94	8/11/94
Date Leached	8/20/94	8/20/94	8/20/94	8/20/94	8/20/94
Date Analyzed (EPA Method 7060)	8/27/94	8/27/94	8/27/94	8/27/94	8/27/94
Date Analyzed (EPA Method 7131)	8/27/94	8/27/94	8/27/94	8/27/94	8/27/94
Date Analyzed (EPA Method 7191)	8/29/94	8/29/94	8/29/94	8/29/94	8/29/94
Date Analyzed (EPA Method 7421)	8/25/94	8/25/94	8/25/94	8/25/94	8/25/94
Analyte	EPA Method	Reporting Limit mg/L	Concentration mg/L		
Arsenic	7060	0.05	<0.05	<0.05	<0.05
Cadmium	7131	0.005	<0.005	<0.005	<0.005
Chromium	7191	0.1	<0.10	<0.10	<0.10
Lead	7421	0.0075	<0.0075	<0.0075	<0.0075

Work Order #	38	39	40	41	50
Collector's Sample #	EOD-10 (13-15)	EOD-10 (34 - 36)	EOD-2A (5.5-7.5)	EOD-2A (34-36)	EOD-9 (0.5-2.5)
Date Sampled	8/11/94	8/11/94	8/12/94	8/12/94	8/11/94
Date Leached	8/20/94	8/20/94	8/20/94	8/20/94	8/23/94
Date Analyzed (EPA Method 7060)	8/27/94	8/27/94	8/27/94	8/27/94	8/25/94
Date Analyzed (EPA Method 7131)	8/27/94	8/27/94	8/27/94	8/27/94	8/26/94
Date Analyzed (EPA Method 7191)	8/29/94	8/29/94	8/29/94	8/29/94	8/26/94
Date Analyzed (EPA Method 7421)	8/25/94	8/25/94	8/25/94	8/25/94	8/27/94
Analyte	EPA Method	Reporting Limit mg/L	Concentration mg/L		
Arsenic	7060	0.05	<0.05	<0.05	<0.05
Cadmium	7131	0.005	<0.005	<0.005	<0.005
Chromium	7191	0.10	<0.10	<0.10	<0.10
Lead	7421	0.0075	<0.0075	<0.0075	<0.0075

**ANALYTICAL REVIEW / DATE:**

Project ID #: 44-02

Metals

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Project ID Name: SK - Pekin

SK Lab Project #: 94-053

Date Reported: 12/2/94

**ANALYTICAL RESULTS****Metals in TCLP Leachate**

Work Order #			51	52	53	54	55
Collector's Sample #			EOD-9 (32-34)	BG-1 (0.5-2.5)	BG-1 (8-10)	BG-2 (0.5-2.5)	BG-2 (13-15)
Date Sampled			8/11/94	8/12/94	8/12/94	8/12/94	8/12/94
Date Leached			8/23/94	8/23/94	8/23/94	8/23/94	8/23/94
Date Analyzed (EPA Method 7060)			8/25/94	8/25/94	8/25/94	8/25/94	8/25/94
Date Analyzed (EPA Method 7131)			8/26/94	8/26/94	8/26/94	8/26/94	8/26/94
Date Analyzed (EPA Method 7191)			8/29/94	8/29/94	8/29/94	8/29/94	8/29/94
Date Analyzed (EPA Method 7421)			8/27/94	8/27/94	8/27/94	8/27/94	8/27/94
Analyte	EPA Method	Reporting Limit mg/L	Concentration mg/L				
Arsenic	7060	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Cadmium	7131	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Chromium	7191	0.1	<0.10	<0.10	<0.10	<0.10	<0.10
Lead	7421	0.0075	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075

Work Order #		56	57	
Collector's Sample #		BG-3 (0.5-2.5)	BG-3 (14-16)	
Date Sampled		8/12/94	8/12/94	
Date Leached		8/23/94	8/23/94	
Date Analyzed (EPA Method 7060)		8/25/94	8/25/94	
Date Analyzed (EPA Method 7131)		8/26/94	8/26/94	
Date Analyzed (EPA Method 7191)		8/29/94	8/29/94	
Date Analyzed (EPA Method 7421)		8/27/94	8/29/94	
Analyte	EPA Method	Reporting Limit mg/L	Concentration mg/L	
Arsenic	7060	0.05	<0.05	<0.05
Cadmium	7131	0.005	<0.005	<0.005
Chromium	7191	0.10	<0.10	<0.10
Lead	7421	0.0075	<0.0075	<0.0075

**ANALYTICAL REVIEW / DATE:**

Project ID #: 44-02

Metals

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Project ID Name: SK - Pekin

SK Lab Project #: 94-053

Date Reported: 12/5/94

**ANALYTICAL RESULTS****Metals in TCLP Leachate**

Work Order #	08	☆ 09	10	☆ 11	12		
Collector's Sample #	RFI-1 (2-4)	RFI-1 (4-6)	RFI-2 (0-2)	RFI-2 (2-4)	RFI-3 (0-2)		
Date Sampled	8/10/94	8/10/94	8/10/94	8/10/94	8/10/94		
Date Leached	8/17/94	8/17/94	8/17/94	8/18/94	8/18/94		
Date Analyzed (EPA Method 7060)	8/20/94	8/20/94	8/20/94	8/24/94	8/24/94		
Date Analyzed (EPA Method 6010)	8/22/94	8/22/94	8/22/94	8/24/94	8/24/94		
Date Analyzed (EPA Method 7131)	8/22/94	8/22/94	8/22/94	8/24/94	8/24/94		
Date Analyzed (EPA Method 7421)	8/25/94	8/25/94	8/29/94	8/27/94	8/27/94		
Date Analyzed (EPA Method 7470)	8/20/94	8/20/94	8/20/94	8/20/94	8/20/94		
Date Analyzed (EPA Method 7740)	8/26/94	8/26/94	8/26/94	8/26/94	8/26/94		
Date Analyzed (EPA Method 7761)	8/26/94	8/26/94	8/26/94	8/26/94	8/26/94		
Analyte	EPA Method	Reporting Limit mg/L	Concentration mg/L				
Arsenic	7060	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Barium	6010	2.00	<2.00	<2.00	<2.00	<2.00	<2.00
Cadmium	7131	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Chromium	6010	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Lead	7421	0.0075	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075
Mercury	7470	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Selenium	7740	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Silver	7761	0.05	<0.05	<0.05	<0.05	<0.05	<0.05

ANALYTICAL REVIEW / DATE:

Project ID #: 44-02  
Project ID Name: SK - Pekin  
SK Lab Project #: 94-053  
Date Reported: 12/2/94

TPH

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## ANALYTICAL RESULTS

### Total Petroleum Hydrocarbons as Mineral Spirits in Soil

Modified EPA Method 8015

Extraction By EPA Method 3550

Reporting Limit: 50 mg/Kg

Work Order #	Collector's Sample #	Date Sampled	Date Extracted	Date Analyzed	Concentration mg/Kg
01	EOD-1 (12-14)	8/9/94	8/15/94	8/15/94	< 50
02	EOD-3 (10-12)	8/9/94	8/15/94	8/15/94	1345.00
03	EOD-3 (32-34)	8/9/94	8/15/94	8/15/94	423.00
04	EOD-4 (10-12)	8/10/94	8/15/94	8/15/94	< 50
05	EOD-4 (17.5-19.5)	8/10/94	8/15/94	8/15/94	< 50
06	EOD-5 (13-15)	8/10/94	8/15/94	8/15/94	< 50
07	EOD-5 (32-34)	8/10/94	8/15/94	8/15/94	< 50
30	EOD-6 (0.5-2.5)	8/11/94	8/17/94	8/25/94	4492.00
31	EOD-6 (15.5-17.5)	8/11/94	8/17/94	8/19/94	149.00
32	EOD-6 (34-36)	8/11/94	8/17/94	8/18/94	61.00
33	EOD-7 (13-15)	8/11/94	8/17/94	8/19/94	< 50
34	EOD-7 (34-36)	8/11/94	8/17/94	8/18/94	< 50
35	EOD-8 (13-15)	8/11/94	8/17/94	8/18/94	< 50
36	EOD-8 (34-36)	8/11/94	8/17/94	8/19/94	< 50
37	EOD-9 (34-36)	8/11/94	8/17/94	8/19/94	< 50
38	EOD-10 (13-15)	8/11/94	8/17/94	8/25/94	< 50
39	EOD-10 (34-36)	8/11/94	8/17/94	8/18/94	< 50
40	EOD-2A (5.5-7.5)	8/12/94	8/17/94	8/22/94	638.00
41	EOD-2A (34-36)	8/12/94	8/17/94	8/22/94	1224.00

ANALYTICAL REVIEW / DATE:

Project ID #: 44-02  
Project ID Name: SK - Pekin  
SK Lab Project #: 94-053  
Date Reported: 9/9/94

TPH

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## ANALYTICAL RESULTS

### Total Petroleum Hydrocarbons as Mineral Spirits in Soil


Modified EPA Method 8015

Extraction By EPA Method 3550

Reporting Limit: 50 mg/Kg

Work Order #	Collector's Sample #	Date Sampled	Date Extracted	Date Analyzed	Concentration mg/Kg
☆ 09	RFI-1 (4-6)	8/10/94	8/15/94	8/15/94	< 50
☆ 11	RFI-2 (2-4)	8/10/94	8/15/94	8/16/94	< 50
17	RFI-5 (3-5)	8/10/94	8/15/94	8/16/94	< 50
18	RFI-5 (5-7)	8/10/94	8/15/94	8/16/94	< 50
19	RFI-6 (3-5)	8/10/94	8/15/94	8/16/94	< 50
20	RFI-6 (5-7)	8/10/94	8/15/94	8/16/94	< 50
21	RFI-7 (4-6)	8/10/94	8/15/94	8/16/94	< 50
22	RFI-7 (6-8)	8/10/94	8/15/94	8/16/94	< 50
23	RFI-8 (4-6)	8/10/94	8/15/94	8/16/94	< 50
24	RFI-8 (6-8)	8/10/94	8/15/94	8/16/94	< 50
25	RFI-9 (4-6)	8/10/94	8/17/94	8/18/94	< 50
26	RFI-9 (6-8)	8/10/94	8/17/94	8/18/94	< 50
27	RFI-10 (4-6)	8/10/94	8/17/94	8/18/94	< 50
28	RFI-10 (6-8)	8/10/94	8/17/94	8/18/94	< 50
29	RFI-21 (10-12)	8/10/94	8/17/94	8/18/94	< 50

ANALYTICAL REVIEW / DATE:

 9/13/94

Project ID #: 44-02

EOD Volatiles

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Project ID Name: SK - Pekin

K Lab Project #: 94-053

Date Reported: 12/2/94

**ANALYTICAL RESULTS****EOD Volatile Organics in Soil**

EPA Method 8240

Work Order #	01	02	03	04	05
Collector's Sample #	EOD-1 (12-14)	EOD-3 (10-12)	EOD-3 (32-34)	EOD-4 (10-12)	EOD-4 (17.5-19.5)
Date Sampled	8/9/94	8/9/94	8/9/94	8/10/94	8/10/94
Date Analyzed	8/16/94	8/17/94	8/17/94	8/17/94	8/16/94
Analyte	Report Limit mg/Kg	Concentration mg/Kg			
Acetone	0.7	<0.7	<0.7	<0.7	<0.7
Ethylbenzene	0.7	<0.7	<0.7	<0.7	<0.7
Methylene Chloride	0.005	<0.005	<0.005	<0.005	<0.005
Xylenes	10.0	<10.0	<10.0	<10.0	<10.0

Work Order #	06	07	09	11	30
Collector's Sample #	EOD-5 (13-15)	EOD-5 (32-34)	RFI-1 (4-6)	RFI-2 (2-4)	EOD-6 (0.5-2.5)
Date Sampled	8/10/94	8/10/94	8/10/94	8/10/94	8/11/94
Date Analyzed	8/16/94	8/16/94	8/16/94	8/16/94	8/17/94
Analyte	Report Limit mg/Kg	Concentration mg/Kg			
Acetone	0.7	<0.7	<0.7	<0.7	<0.7
Ethylbenzene	0.7	<0.7	<0.7	<0.7	<0.7
Methylene Chloride	0.005	<0.005	<0.005	<0.005	<0.005
Xylenes	10.0	<10.0	<10.0	<10.0	<10.0

ANALYTICAL REVIEW / DATE:



Project ID Name: SK - Pekin

K Lab Project #: 94-053

Date Reported: 12/2/94

**ANALYTICAL RESULTS****EOD Volatile Organics in Soil**

EPA Method 8240

Work Order #	31	32	33	34	35
Collector's Sample #	EOD-6 (15.5-17.5)	EOD-6 (34-36)	EOD-7 (13-15)	EOD-7 (34 - 36)	EOD-8 (13-15)
Date Sampled	8/11/94	8/11/94	8/11/94	8/11/94	8/11/94
Date Analyzed	8/17/94	8/17/94	8/17/94	8/17/94	8/19/94
Analyte	Report Limit mg/Kg	Concentration mg/Kg			
Acetone	0.7	<0.7	<0.7	<0.7	<0.7
Ethylbenzene	0.7	<0.7	<0.7	<0.7	<0.7
Methylene Chloride	0.005	<0.005	<0.005	<0.005	<0.005
Xylenes	10.0	<10.0	<10.0	<10.0	<10.0

Work Order #	36	37	38	39	40
Collector's Sample #	EOD-8 (34-36)	EOD-9 (34-36)	EOD-10 (13-15)	EOD-10 (34 - 36)	EOD-2A (5.5-7.5)
Date Sampled	8/11/94	8/11/94	8/11/94	8/11/94	8/12/94
Date Analyzed	8/17/94	8/17/94	8/17/94	8/17/94	8/17/94
Analyte	Report Limit mg/Kg	Concentration mg/Kg			
Acetone	0.7	<0.7	<0.7	<0.7	<0.7
Ethylbenzene	0.7	<0.7	<0.7	<0.7	<0.7
Methylene Chloride	0.005	<0.005	<0.005	<0.005	<0.005
Xylenes	10.0	<10.0	<10.0	<10.0	<10.0

ANALYTICAL REVIEW / DATE:

Project ID #: 44-02  
Project ID Name: SK - Pekin  
K Lab Project #: 94-053  
Date Reported: 12/2/94

EOD Volatiles

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**ANALYTICAL RESULTS**  
**EOD Volatile Organics in Soil**  
EPA Method 8240

Work Order #		41
Collector's Sample #		EOD-2A (34-36)
Date Sampled		8/12/94
Date Analyzed		8/17/94
Analyte	Reporting Limit mg/Kg	Concentration mg/Kg
Acetone	0.7	<0.7
Ethylbenzene	0.7	<0.7
Methylene Chloride	0.005	<0.005
Xylenes	10.0	<10.0

ANALYTICAL REVIEW / DATE:

Project ID #: 44-02

EOD Semi-Volatiles

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Project ID Name: SK - Pekin

SK Lab Project #: 94-053

Date Reported: 12/2/94

**ANALYTICAL RESULTS****EOD Semi-Volatile Organics in Soil**

EPA Method 8270

Work Order #	01	02	03	04	05
Collector's Sample #	EOD-1 (12-14)	EOD-3 (10-12)	EOD-3 (32-34)	EOD-4 (10-12)	EOD-4 (17.5-19.5)
Date Sampled	8/9/94	8/9/94	8/9/94	8/10/94	8/10/94
Date Extracted	8/15/94	8/15/94	8/16/94	8/16/94	8/16/94
Date Analyzed	8/17/94	8/18/94	8/19/94	8/19/94	8/19/94
Analyte	Reporting Limit mg/Kg	Concentration mg/Kg			
Bis(2-ethyl-hexyl)phthalate	0.33	<0.33	<0.33	<0.33	<0.33
Di-n-butyl phthalate	14.0	<14.0	<14.0	<14.0	<14.0
Isophorone	1.4	<1.4	<1.4	<1.4	<1.4

Work Order #	06	07	09	11	30
Collector's Sample #	EOD-5 (13-15)	EOD-5 (32-34)	RFI-1 (4-6)	RFI-2 (2-4)	EOD-6 (0.5-2.5)
Date Sampled	8/10/94	8/10/94	8/10/94	8/10/94	8/11/94
Date Extracted	8/16/94	8/16/94	8/16/94	8/16/94	8/17/94
Date Analyzed	8/19/94	8/19/94	8/19/94	8/19/94	8/23/94
Analyte	Reporting Limit mg/Kg	Concentration mg/Kg			
Bis(2-ethyl-hexyl)phthalate	0.33	<0.33	<0.33	<0.33	<0.33
Di-n-butyl phthalate	14.0	<14.0	<14.0	<14.0	<14.0
Isophorone	1.4	<1.4	<1.4	<1.4	<1.4

ANALYTICAL REVIEW / DATE:

Project ID #: 44-02

EOD Semi-Volatiles

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Project ID Name: SK - Pekin

SK Lab Project #: 94-053

Date Reported: 12/2/94

**ANALYTICAL RESULTS****EOD Semi-Volatile Organics in Soil**

EPA Method 8270

Work Order #	31	32	33	34	35
Collector's Sample #	EOD-6 (15.5-17.5)	EOD-6 (34-36)	EOD-7 (13-15)	EOD-7 (34 - 36)	EOD-8 (13-15)
Date Sampled	8/11/94	8/11/94	8/11/94	8/11/94	8/11/94
Date Extracted	8/17/94	8/22/94	8/18/94	8/18/94	8/18/94
Date Analyzed	8/22/94	8/24/94	8/23/94	8/23/94	8/23/94
Analyte	Reporting Limit mg/Kg	Concentration mg/Kg			
Bis(2-ethyl-hexyl)phthalate	0.33	<0.33	<0.33	<0.33	<0.33
Di-n-butyl phthalate	14.0	<14.0	<14.0	<14.0	<14.0
Isophorone	1.4	<1.4	<1.4	<1.4	<1.4

Work Order #	36	37	38	39	40
Collector's Sample #	EOD-8 (34-36)	EOD-9 (34-36)	EOD-10 (13-15)	EOD-10 (34 - 36)	EOD-2A (5.5-7.5)
Date Sampled	8/11/94	8/11/94	8/11/94	8/11/94	8/12/94
Date Extracted	8/24/94	8/24/94	8/24/94	8/24/94	8/18/94
Date Analyzed	8/25/94	8/25/94	8/25/94	8/25/94	8/24/94
Analyte	Reporting Limit mg/Kg	Concentration mg/Kg			
Bis(2-ethyl-hexyl)phthalate	0.33	<0.33	<0.33	<0.33	<0.33
Di-n-butyl phthalate	14.0	<14.0	<14.0	<14.0	<14.0
Isophorone	1.4	<1.4	<1.4	<1.4	<1.4

ANALYTICAL REVIEW / DATE:

Project ID #: 44-02

EOD Semi-Volatiles

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Project ID Name: SK - Pekin

CK Lab Project #: 94-053

Date Reported: 12/2/94

## ANALYTICAL RESULTS

### EOD Semi-Volatile Organics in Soil

EPA Method 8270

Work Order #		41
Collector's Sample #		EOD-2A (34-36)
Date Sampled		8/12/94
Date Extracted		8/18/94
Date Analyzed		8/24/94
Analyte	Reporting Limit mg/Kg	Concentration mg/Kg
Bis(2-ethyl-hexyl)phthalate	0.33	<0.33
Di-n-butyl phthalate	14.0	<14.0
Isophorone	1.4	<1.4

ANALYTICAL REVIEW / DATE:

Project ID #: 44-02  
Project ID Name: SK - Pekin  
SK Lab Project #: 94-053  
Date Reported: 12/1/94

Metals

ICAP QC

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**INITIAL CALIBRATION VERIFICATION**  
**QC CHECK SAMPLE REPORT**  
**Metals in TCLP Leachate**

% Acceptability Limits: 90 - 110

Analyte	Date Analyzed	Expected Result mg/L	Observed Result mg/L	% Recovery
Barium	8/22/94	5	5.002	100
Chromium	8/22/94	5	5.025	101

Analyte	Date Analyzed	Expected Result mg/L	Observed Result mg/L	% Recovery
Barium	8/24/94	5	5.021	100
Chromium	8/24/94	5	5.032	101

**METHOD BLANK SUMMARY**  
**Metals in TCLP Leachate**

Lab Blank #:	DB0823B
Date Digested:	8/23/94
Date Analyzed:	8/24/94
Analyte	Concentration mg/L
Barium	<0.02
Chromium	<0.04

Project ID #: 44-02  
Project ID Name: SK - Pekin  
SK Lab Project #: 94-053  
Date Reported: 12/1/94

Metals Method 7470 QC

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**INITIAL CALIBRATION VERIFICATION**  
**QC CHECK SAMPLE REPORT**  
Metals in TCLP Leachate

% Acceptability Limits: 90 - 110

Analyte	Date Analyzed	Expected Result $\mu\text{g/L}$	Observed Result $\mu\text{g/L}$	% Recovery
Mercury	8/22/94	2.5	2.56	102
	8/24/94	2.5	2.5	100

**METHOD BLANK SUMMARY**  
Metals in TCLP Leachate

Lab Blank #:	RBlank3	RBlank5	RBlank4
Date Digested:	8/22/94	8/22/94	8/24/94
Date Analyzed:	8/22/94	8/22/94	8/24/94
Analyte	Concentration $\mu\text{g/L}$		
Mercury	<0.2	<0.2	<0.2

Project ID #: 44-02  
 Project ID Name: SK - Pekin  
 SK Lab Project #: 94-053  
 Date Reported: 12/1/94

Metals

GFAA QC

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**INITIAL CALIBRATION VERIFICATION**  
**QC CHECK SAMPLE REPORT**  
**Metals in TCLP Leachate**

% Acceptability Limits: 90 - 110

Analyte	Date Analyzed	Expected Result $\mu\text{g/L}$	Observed Result $\mu\text{g/L}$	% Recovery
Arsenic	8/20/94	50	52.2	104
	8/24/94	50	48.6	97
	8/25/94	50	49.9	100
	8/27/94	50	51.2	102
Cadmium	8/22/94	5	4.88	98
	8/24/94	5	4.87	97
	8/26/94	5	4.72	94
	8/27/94	5	4.73	95
	8/29/94	5	5.4	108
Chromium	8/26/94	50	52.7	105
	8/29/94	50	49.9	100
	8/19/94	50	51.3	103
	8/24/94	50	50.1	100
Lead	8/25/94	10	9.8	98
	8/27/94	10	9.2	92
	8/29/94	10	10.3	103
	8/30/94	10	10.5	105
Selenium	8/26/94	50	50.5	101
	8/29/94	50	48.7	97
Silver	8/26/94	25	26.38	106
	8/27/94	25	24.56	98



Project ID #: 44-02  
Project ID Name: SK - Pekin  
SK Lab Project #: 94-053  
Date Reported: 12/1/94

Metals ICAP QC

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## LABORATORY CONTROL SAMPLE RESULTS

### Metals in TCLP Leachate

% Acceptability Limits: 80 - 120

Lab Control Sample ID#: LCS823B

Analyte	Date Digested	Date Analyzed	Expected Result mg/L	Observed Result mg/L	% Recovery
Barium	8/23/94	8/24/94	2	1.859	93
Chromium	8/23/94	8/24/94	0.1	0.0973	97

Lab Control Sample ID#: LCS823A

Analyte	Date Digested	Date Analyzed	Expected Result mg/L	Observed Result mg/L	% Recovery
Barium	8/23/94	8/24/94	2	1.937	97
Chromium	8/23/94	8/24/94	0.1	0.1004	100

Lab Control Sample ID#: LCS818

Analyte	Date Digested	Date Analyzed	Expected Result mg/L	Observed Result mg/L	% Recovery
Barium	8/18/94	8/22/94	2	1.968	98
Chromium	8/18/94	8/22/94	0.1	0.0966	97

Project ID #: 44-02  
Project ID Name: SK - Pekin  
SK Lab Project #: 94-053  
Date Reported: 12/1/94

Metals

GFAA QC

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## LABORATORY CONTROL SAMPLE RESULTS

### Metals in TCLP Leachate

% Acceptability Limits: 80 - 120

Lab Control Sample ID#: LCS818

Analyte	Date Digested	Date Analyzed	Expected Result $\mu\text{g/L}$	Observed Result $\mu\text{g/L}$	% Recovery
Arsenic	8/18/94	8/20/94	50	49.4	99
Cadmium	8/18/94	8/22/94	5	4.77	95
Chromium	8/18/94	8/19/94	50	51.6	103
Lead	8/18/94	8/25/94	10	10	100
Selenium	8/18/94	8/26/94	50	54.9	110
Silver	8/18/94	8/26/94	25	27.96	112

Lab Control Sample ID#: LCS8221

Analyte	Date Digested	Date Analyzed	Expected Result $\mu\text{g/L}$	Observed Result $\mu\text{g/L}$	% Recovery
Arsenic	8/22/94	8/24/94	50	46.7	93
Cadmium	8/22/94	8/24/94	5	4.61	92
Chromium	8/22/94	8/24/94	50	60.5	121
Lead	8/22/94	8/25/94	10	10.4	104
Selenium	8/22/94	8/26/94	50	48.3	97
Silver	8/22/94	8/26/94	25	26.12	104

Lab Control Sample ID#: LCS8222

Analyte	Date Digested	Date Analyzed	Expected Result $\mu\text{g/L}$	Observed Result $\mu\text{g/L}$	% Recovery
Arsenic	8/22/94	8/24/94	50	52.2	104
Cadmium	8/22/94	8/24/94	5	4.58	92
Chromium	8/22/94	8/24/94	50	49.5	99
Lead	8/22/94	8/25/94	10	11.1	111
Selenium	8/22/94	8/29/94	50	47.4	95

Project ID #: 44-02

Metals

GFAA QC

Project ID Name: SK - Pekin

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SK Lab Project #: 94-053

Date Reported: 12/1/94

## LABORATORY CONTROL SAMPLE RESULTS

### Metals in TCLP Leachate

% Acceptability Limits: 80 - 120

Lab Control Sample ID#: LCS824

Analyte	Date Digested	Date Analyzed	Expected Result $\mu\text{g/L}$	Observed Result $\mu\text{g/L}$	% Recovery
Arsenic	8/24/94	8/25/94	50	44.2	88
Cadmium	8/24/94	8/26/94	5	4.84	97
Chromium	8/24/94	8/26/94	50	50.4	101
Lead	8/24/94	8/27/94	10	9.1	91
Selenium	8/24/94	8/29/94	50	46.2	92

Lab Control Sample ID#: LCS829

Analyte	Date Digested	Date Analyzed	Expected Result $\mu\text{g/L}$	Observed Result $\mu\text{g/L}$	% Recovery
Lead	8/29/94	8/30/94	10	11.1	111

Lab Control Sample ID#: LCSA

Analyte	Date Digested	Date Analyzed	Expected Result $\mu\text{g/L}$	Observed Result $\mu\text{g/L}$	% Recovery
Cadmium		8/29/94	5	5.32	106

Project ID #: 44-02  
 Project ID Name: SK - Pekin  
 SK Lab Project #: 94-053  
 Date Reported: 12/1/94

Metals ICAP QC

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**MATRIX SPIKE (MS) &  
 MATRIX SPIKE DUPLICATE (MSD) SUMMARY  
 PERCENT RECOVERY & RELATIVE PERCENT DIFFERENCE (RPD)  
 Metals in TCLP Leachate**

Acceptability Limits %

Work Order #: E94-053-10

RPD: 20

Collector's Sample #: RFI-2 (0-2)

% Recovery: 80 - 120

Analyte	Spike Added mg/L	Sample Conc. mg/L	MS Conc. mg/L	MSD Conc. mg/L	MS % Recovery	MSD % Recovery	RPD %
Barium	2	0.9923	2.811	2.767	91	89	2
Chromium	0.1	0	0.0948	0.0944	95	94	0

Work Order #: E94-053-21

Collector's Sample #: RFI-7 (4-6)

Analyte	Spike Added mg/L	Sample Conc. mg/L	MS Conc. mg/L	MSD Conc. mg/L	MS % Recovery	MSD % Recovery	RPD %
Barium	2	0.2454	1.871	1.963	81	86	6
Chromium	0.1	0	0.0848	0.088	85	88	4

Work Order #: E94-053-25

Collector's Sample #: RFI-9 (4-6)

Analyte	Spike Added mg/L	Sample Conc. mg/L	MS Conc. mg/L	MSD Conc. mg/L	MS % Recovery	MSD % Recovery	RPD %
Barium	2	0.4278	2.041	2.083	81	83	3
Chromium	0.1	0	0.0872	0.0915	87	92	5

Work Order #: E94-053-45

Collector's Sample #: BG-3 (2-4)

Analyte	Spike Added mg/L	Sample Conc. mg/L	MS Conc. mg/L	MSD Conc. mg/L	MS % Recovery	MSD % Recovery	RPD %
Barium	2	0.9519	2.618	2.667	83	86	3
Chromium	0.1	0	0.1079	0.0986	108	99	9

Work Order #: E94-053-49

Collector's Sample #: BG-3 (18-20)

Analyte	Spike Added mg/L	Sample Conc. mg/L	MS Conc. mg/L	MSD Conc. mg/L	MS % Recovery	MSD % Recovery	RPD %
Barium	2	0.34	1.963	1.965	81	81	0
Chromium	0.1	0	0.088	0.0884	88	88	0

Project ID #: 44-02  
Project ID Name: SK - Pekin  
SK Lab Project #: 94-053  
Date Reported: 12/1/94

Metals Method 7470 QC

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**MATRIX SPIKE (MS) &  
MATRIX SPIKE DUPLICATE (MSD) SUMMARY**  
**PERCENT RECOVERY & RELATIVE PERCENT DIFFERENCE (RPD)**  
**Metals in TCLP Leachate**

Acceptability Limits %

Work Order #: E94-053-49

RPD: 20

Collector's Sample #: BG-3 (18-20)

% Recovery: 80 - 120

Analyte	Spike Added mg/L	Sample Conc. $\mu$ g/L	MS Conc. $\mu$ g/L	MSD Conc. $\mu$ g/L	MS % Recovery	MSD % Recovery	RPD %
Mercury	2.5	0	2.38	2.39	95	96	0

Work Order #: E94-053-25

Collector's Sample #: RFI-9 (4-6)

Analyte	Spike Added mg/L	Sample Conc. $\mu$ g/L	MS Conc. $\mu$ g/L	MSD Conc. $\mu$ g/L	MS % Recovery	MSD % Recovery	RPD %
Mercury	2.5	0	2.55	2.54	102	102	0

Project ID #: 44-02

Metals

GFAA QC

Project ID Name: SK - Pekin

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SK Lab Project #: 94-053

Date Reported: 12/1/94

**MATRIX SPIKE (MS) &  
MATRIX SPIKE DUPLICATE (MSD) SUMMARY  
PERCENT RECOVERY & RELATIVE PERCENT DIFFERENCE (RPD)  
Metals in TCLP Leachate**

Acceptability Limits %

Analyte: Arsenic

RPD: 20

% Recovery: 80 - 120

Work Order #	Spike Added mg/L	Sample Conc. $\mu$ g/L	MS Conc. $\mu$ g/L	MSD Conc. $\mu$ g/L	MS % Recovery	MSD % Recovery	RPD %
05	50	0.3	55.7	54.7	111	109	2
10	50	0.9	54.3	54.4	107	107	0
21	50	0	58.9	59.1	118	118	0
25	50	0.2	58.5	59.5	117	119	2
31	50	0	56.1	57.2	112	114	2
37	50	0.7	51.9	53.6	102	106	3
45	50	0.9	46.4	46.2	91	91	0
49	50	0	56.7	56.3	113	113	1
57	50	0	56.6	56.4	113	113	0

Analyte: Chromium

Work Order #	Spike Added mg/L	Sample Conc. $\mu$ g/L	MS Conc. $\mu$ g/L	MSD Conc. $\mu$ g/L	MS % Recovery	MSD % Recovery	RPD %
05	50	11.3	56.4	62	90	101	12
31	50	0.7	52.3	52.6	103	104	1
37	50	4.6	55	56	101	103	2
57	50	4.3	55.2	60.7	102	113	10

Project ID #: 44-02  
 Project ID Name: SK - Pekin  
 SK Lab Project #: 94-053  
 Date Reported: 12/1/94

Metals GFAA QC  
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**MATRIX SPIKE (MS) &  
 MATRIX SPIKE DUPLICATE (MSD) SUMMARY**  
**PERCENT RECOVERY & RELATIVE PERCENT DIFFERENCE (RPD)**  
**Metals in TCLP Leachate**

Acceptability Limits %

Analyte: Cadmium

RPD: 20

% Recovery: 80 - 120

Work Order #	Spike Added mg/L	Sample Conc. µg/L	MS Conc. µg/L	MSD Conc. µg/L	MS % Recovery	MSD % Recovery	RPD %
05	5	8.36	12.96	13.1	92	95	3
10	5	0.29	4.91	4.81	92	90	2
21	5	1.49	5.89	6.09	88	92	4
31	5	1.61	5.8	6.03	84	88	5
37	5	2.88	7.01	7.09	83	84	2
45	5	0.19	5.02	4.86	97	93	3
49	5	1.07	5.49	5.57	88	90	2
57	5	1.25	5.58	5.72	87	89	3
25R	5	1.43	5.88	5.96	89	91	2

Analyte: Lead

Work Order #	Spike Added mg/L	Sample Conc. µg/L	MS Conc. µg/L	MSD Conc. µg/L	MS % Recovery	MSD % Recovery	RPD %
05	10	0	8.6	8.2	86	82	5
10	10	0	8.5	7.6	85	76*	11
21	10	0.7	10.9	11.3	102	106	4
25	10	0.3	10.2	8.8	99	85	15
37	10	0	11.1	10.4	111	104	7
45	10	0	9.2	7.8	92	78*	16
49	10	0.6	9.4	10.1	88	95	8
57	10	0	8.6	8.2	86	82	5
31R	10	0	9.5	10.2	95	102	7

\* Low recovery due to matrix effect confirmed by redigestion.

Project ID #: 44-02

Metals

GFAA QC

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Date Reported: 12/1/94

**MATRIX SPIKE (MS) &  
MATRIX SPIKE DUPLICATE (MSD) SUMMARY**  
**PERCENT RECOVERY & RELATIVE PERCENT DIFFERENCE (RPD)**  
**Metals in TCLP Leachate**

Analyte: Selenium

Acceptability Limits %

RPD: 20

% Recovery: 80 - 120

Work Order #	Spike Added mg/L	Sample Conc. $\mu$ g/L	MS Conc. $\mu$ g/L	MSD Conc. $\mu$ g/L	MS % Recovery	MSD % Recovery	RPD %
10	50	0	44.4	44.1	89	88	1
21	50	0	46.8	46.2	94	92	1
25	50	0	42	40.8	84	82	3
45	50	0.5	52.2	52.5	103	104	1
49	50	0.1	46.2	46.8	92	93	1

Analyte: Silver

Work Order #	Spike Added mg/L	Sample Conc. $\mu$ g/L	MS Conc. $\mu$ g/L	MSD Conc. $\mu$ g/L	MS % Recovery	MSD % Recovery	RPD %
10	25	0	21.8	21.2	87	85	3
21	25	0.1	21.1	21.1	84	84	0
25	25	0.15	23.79	21.8	95	87	9
45	25	0.12	20.5	20.6	82	82	0
49	25	0.08	20.7	20.75	82	83	0



Project ID #: 44-02  
Project ID Name: SK - Pekin  
SK Lab Project #: 94-053  
Date Reported: 12/1/94

Semi-Volatiles

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## SURROGATE RECOVERY SUMMARY

### Semi-Volatile Organics in Soil

EPA Method 8270

#### 4-Methylphenol

Work Order #	Collector's Sample #	Percent Recovery		
		S1 (PHL)	S2 (2FP)	TOTAL OUT
01	EOD-1(12-14)	57	55	0
02	EOD-3 (10-12)	70	81	0
03	EOD-3 (32-34)	61	51	0
04	EOD-4 (10-12)	45	85	0
05	EOD-4(17.5-19.5)	58	51	0
06	EOD-5 (13-15)	72	85	0
07	EOD-5 (32-34)	58	67	0
08	RFI-1 (2-4)	56	64	0
09	RFI-1 (4-6)	54	64	0
10	RFI-2 (0-2)	85	90	0
11	RFI-2 (2-4)	92	122	1
12	RFI-3 (0-2)	87	118	0
13	RFI-3 (0-2)	76	83	0
14	RFI-4 (0-2)	77	86	0
15	RFI-4 (2-4)	69	72	0
16	RFI-20 (6-8)	80	89	0
17	RFI-5 (3-5)	57	44	0
18	RFI-5 (5-7)	48	35	0
19	RFI-6 (3-5)	39	37	0
20	RFI-6 (5-7)	62	43	0
21	RFI-7 (4-6)	51	42	0
22	RFI-7 (6-8)	52	43	0
23	RFI-8 (4-6)	52	46	0
24	RFI-8 (6-8)	60	52	0
25	RFI-9 (4-6)	38	34	0

Project ID #: 44-02  
 Project ID Name: SK - Pekin  
 SK Lab Project #: 94-053  
 Date Reported: 12/1/94

Semi-Volatiles

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## SURROGATE RECOVERY SUMMARY

### Semi-Volatile Organics in Soil

EPA Method 8270

#### 4-Methylphenol

Work Order #	Collector's Sample #	Percent Recovery		
		S1 (PHL)	S2 (2FP)	TOTAL OUT
26	RFI-9 (6-8)	66	79	0
27	RFI-10 (4-6)	64	72	0
28	RFI-10 (6-8)	88	98	0
29	RFI-21 (10-12)	74	72	0
30	EOD-6 (0.5-2.5)	89	140	1
31	EOD-6 (15.5-17.5)	85	97	0
32	EOD-6 (34-36)	64	67	0
33	EOD-7 (13-15)	99	83	0
34	EOD-7 (34-36)	39	41	0
35	EOD-8 (13-15)	62	66	0
36	EOD-8 (34-36)	83	90	0
37	EOD-9 (34-36)	83	89	0
38	EOD-10 (13-15)	89	98	0
39	EOD-10 (34-36)	111	102	0
40	EOD-2A (5.5-7.5)	45	31	0
41	EOD-2A (34-36)	47	33	0

#### Surrogates

S1	PHL	Phenol-d5
S2	2FP	2-Fluorophenol

#### Recovery Limits

24 - 113
25 - 121

Review / Date:

Project ID #: 44-02  
Project ID Name: SK - Pekin  
SK Lab Project #: 94-053  
Date Reported: 12/1/94

Semi-Volatiles

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## METHOD BLANK SUMMARY

### Semi-Volatile Organics in Soil

EPA Method 8270

Analyte: 4-Methylphenol

Lab Blank #	Date Extracted	Date Analyzed	Concentration mg/Kg
EBLK0812	8/12/94	8/17/94	<0.060
EBLK0815	8/15/94	8/17/94	<0.060
EBLK0816	8/16/94	8/18/94	<0.060
EBLK0817	8/17/94	8/23/94	<0.060
EBLK0818	8/18/94	8/22/94	<0.060
EBLK0824	8/24/94	8/25/94	<0.060

Review / Date:

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Project ID #: 44-02  
 Project ID Name: SK - Pekin  
 SK Lab Project #: 94-053  
 Date Reported: 12/1/94

Semi-Volatiles

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**MATRIX SPIKE (MS) &  
 MATRIX SPIKE DUPLICATE (MSD) SUMMARY**  
**PERCENT RECOVERY & RELATIVE PERCENT DIFFERENCE (RPD)**

**Semi-Volatile Organics in Soil**

EPA Method 8270

Acceptability Limits %

Work Order #: E94-053-01

RPD: 20

Collector's Sample #: EOD-1 (12-14)

% Recovery: 27 - 120

Analyte	Spike Added mg/Kg	Sample Conc. mg/Kg	MS Conc. mg/Kg	MSD Conc. mg/Kg	MS % Recovery	MSD % Recovery	RPD %
Phenol 5-112	80	<66	60.8	65.4	76	82	7
2-Chlorophenol 23-34	80	<66	48.4	55.2	61	69	13
1,4-Dichlorobenzene 20-24	80	<66	42.8	52.6	54	66	21
N-Nitrosodipropylamine 9-230	80	<66	50.2	56	63	70	11
1,2,4-Trichlorobenzene 44-142	80	<66	39.2	46.9	49	59	18
4-Chloro-3-Methylphenol 22-147	80	<66	71.5	65.1	89	81	9
Acenaphthene 45-145	80	<66	53.4	53.3	67	67	0
4-Nitrophenol D-132	80	<66	9.6	13	12	16	30
2,4-Dinitrotoluene 39-139	80	<66	48.8	42.6	61	53	14
Pentachlorophenol 14-176	80	<66	3.6	0	5	0	200
Pyrene 32-115	80	<66	46.2	45.1	58	56	2

Project ID #: 44-02  
 Project ID Name: SK - Pekin  
 SK Lab Project #: 94-053  
 Date Reported: 12/1/94

Semi-Volatiles

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**MATRIX SPIKE (MS) &  
 MATRIX SPIKE DUPLICATE (MSD) SUMMARY  
 PERCENT RECOVERY & RELATIVE PERCENT DIFFERENCE (RPD)**

**Semi-Volatile Organics in Soil**

EPA Method 8270

Acceptability Limits %

Work Order #: E94-053-13

RPD: 20

Collector's Sample #: RFI-3 (0-2)

% Recovery: 27 - 120

Analyte	Spike Added mg/Kg	Sample Conc. mg/Kg	MS Conc. mg/Kg	MSD Conc. mg/Kg	MS % Recovery	MSD % Recovery	RPD %
Phenol	80	<66	69.3	73.1	87	91	5
2-Chlorophenol	80	<66	67.5	71.4	84	89	6
1,4-Dichlorobenzene	80	<66	56.8	60	71	75	5
N-Nitrosodipropylamine	80	<66	67.5	69.1	84	86	2
1,2,4-Trichlorobenzene	80	<66	76.5	78	96	98	2
4-Chloro-3-Methylphenol	80	<66	81.6	82.8	102	104	1
Acenaphthene	80	<66	67.8	69.4	85	87	2
4-Nitrophenol	80	<66	59.3	61.8	74	77	4
2,4-Dinitrotoluene	80	<66	63	62.7	79	78	0
Pentachlorophenol	80	<66	69.3	71.1	87	89	3
Pyrene	80	<66	69.8	71.3	87	89	2

Project ID #: 44-02  
 Project ID Name: SK - Pekin  
 SK Lab Project #: 94-053  
 Date Reported: 12/1/94

Semi-Volatiles

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**MATRIX SPIKE (MS) &  
 MATRIX SPIKE DUPLICATE (MSD) SUMMARY**  
**PERCENT RECOVERY & RELATIVE PERCENT DIFFERENCE (RPD)**  
**Semi-Volatile Organics in Soil**

EPA Method 8270

Acceptability Limits %

Work Order #: E94-053-24  
 Collector's Sample #: RFI-8 (6-8)

RPD: 20

% Recovery: 27 - 120

Analyte	Spike Added mg/Kg	Sample Conc. mg/Kg	MS Conc. mg/Kg	MSD Conc. mg/Kg	MS % Recovery	MSD % Recovery	RPD %
Phenol	80	<66	52.4	54.3	66	68	3
2-Chlorophenol	80	<66	44.2	46.2	55	58	4
1,4-Dichlorobenzene	80	<66	26	24.7	33	31	5
N-Nitrosodipropylamine	80	<66	51.6	61.8	65	77	18
1,2,4-Trichlorobenzene	80	<66	36	33.8	45	42	6
4-Chloro-3-Methylphenol	80	<66	64	63.9	80	80	0
Acenaphthene	80	<66	49.7	48.4	62	61	3
4-Nitrophenol	80	<66	37.2	39.3	47	49	5
2,4-Dinitrotoluene	80	<66	51.8	49.9	65	62	4
Pentachlorophenol	80	<66	65.2	60.2	82	75	8
Pyrene	80	<66	46.8	61.4	59	77	27

Project ID #: 44-02  
Project ID Name: SK - Pekin  
SK Lab Project #: 94-053  
Date Reported: 12/1/94

Semi-Volatiles

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**MATRIX SPIKE (MS) &  
MATRIX SPIKE DUPLICATE (MSD) SUMMARY**  
**PERCENT RECOVERY & RELATIVE PERCENT DIFFERENCE (RPD)**  
**Semi-Volatile Organics in Soil**

EPA Method 8270

Acceptability Limits %

Work Order #: E94-053-28R

RPD: 20

Collector's Sample #:

% Recovery: 27 - 120

Analyte	Spike Added mg/Kg	Sample Conc. mg/Kg	MS Conc. mg/Kg	MSD Conc. mg/Kg	MS % Recovery	MSD % Recovery	RPD %
Phenol	80	<66	71.4	60	89	75	18
2-Chlorophenol	80	<66	67.2	55.7	84	70	19
1,4-Dichlorobenzene	80	<66	55.3	49.8	69	62	10
N-Nitrosodipropylamine	80	<66	79.2	72	99	90	10
1,2,4-Trichlorobenzene	80	<66	56.2	51.5	70	64	9
4-Chloro-3-Methylphenol	80	<66	68.1	57.7	85	72	17
Acenaphthene	80	<66	62.7	57.4	78	72	9
4-Nitrophenol	80	<66	73.1	61	91	76	18
2,4-Dinitrotoluene	80	<66	58.8	52.1	74	65	12
Pentachlorophenol	80	<66	95	81.2	119	102	16
Pyrene	80	<66	47.4	43.3	59	54	9

Project ID #: 44-02  
 Project ID Name: SK - Pekin  
 SK Lab Project #: 94-053  
 Date Reported: 12/1/94

Semi-Volatiles

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**MATRIX SPIKE (MS) &  
 MATRIX SPIKE DUPLICATE (MSD) SUMMARY  
 PERCENT RECOVERY & RELATIVE PERCENT DIFFERENCE (RPD)  
 Semi-Volatile Organics in Soil**

EPA Method 8270

Acceptability Limits %

Work Order #: E94-053-32R

RPD: 20

Collector's Sample #:

% Recovery: 27 - 120

Analyte	Spike Added mg/Kg	Sample Conc. mg/Kg	MS Conc. mg/Kg	MSD Conc. mg/Kg	MS % Recovery	MSD % Recovery	RPD %
Phenol	80	<66	64.8	62.1	81	78	4
2-Chlorophenol	80	<66	67.2	51.2	84	64	27
1,4-Dichlorobenzene	80	<66	23.4	16	29	20	38
N-Nitrosodipropylamine	80	<66	79.7	79.1	100	99	1
1,2,4-Trichlorobenzene	80	<66	36.8	25.3	46	32	37
4-Chloro-3-Methylphenol	80	<66	67.5	68	84	85	1
Acenaphthene	80	<66	57.8	56.4	72	71	2
4-Nitrophenol	80	<66	44.9	50.8	56	64	12
2,4-Dinitrotoluene	80	<66	42.8	31.3	54	39	31
Pentachlorophenol	80	<66	57.7	59.6	72	75	3
Pyrene	80	<66	62.7	63.2	78	79	1



Project ID #: 44-02  
Project ID Name: SK - Pekin  
SK Lab Project #: 94-053  
Date Reported: 12/1/94

Semi-Volatiles

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**MATRIX SPIKE (MS) &  
MATRIX SPIKE DUPLICATE (MSD) SUMMARY**  
**PERCENT RECOVERY & RELATIVE PERCENT DIFFERENCE (RPD)**  
**Semi-Volatile Organics in Soil**  
EPA Method 8270

Acceptability Limits %

Work Order #: E94-053-41

RPD: 20

Collector's Sample #: EOD-2A (34-36)

% Recovery: 27 - 120

Analyte	Spike Added mg/Kg	Sample Conc. mg/Kg	MS Conc. mg/Kg	MSD Conc. mg/Kg	MS % Recovery	MSD % Recovery	RPD %
Phenol	80	<66	44.3	44.6	55	56	0
2-Chlorophenol	80	<66	30.7	27.5	38	34	11
1,4-Dichlorobenzene	80	<66	16.9	13.7	21	17	21
N-Nitrosodipropylamine	80	<66	68.8	86.8	86	109	23
1,2,4-Trichlorobenzene	80	<66	41.5	30.5	52	38	31
4-Chloro-3-Methylphenol	80	<66	58.5	59.9	73	75	2
Acenaphthene	80	<66	54	53.9	68	67	0
4-Nitrophenol	80	<66	8.4	15.2	11	19	58
2,4-Dinitrotoluene	80	<66	32.1	28.4	40	36	12
Pentachlorophenol	80	<66	34.3	44.8	43	56	27
Pyrene	80	<66	57.7	48.9	72	61	17

Review / Date:

Project ID #: 44-02                      TPH                      Page 1 of 4  
Project ID Name: SK - Pekin  
SK Lab Project #: 94-053  
Date Reported: 12/1/94

## SURROGATE COMPOUND RECOVERY

o-Terphenyl

Total Petroleum Hydrocarbons as Mineral Spirits in Soil

Modified EPA Method 8015

Acceptability Limits: 80 - 146

Work Order #	Collector's Sample #	Surrogate Recovery %
01	EOD-1(12-14)	88
02	EOD-3 (10-12)	91
03	EOD-3 (32-34)	95
04	EOD-4 (10-12)	93
05	EOD-4(17.5-19.5)	93
06	EOD-5 (13-15)	92
07	EOD-5 (32-34)	102
09	RFI-1 (4-6)	94
11	RFI-2 (2-4)	84
17	RFI-5 (3-5)	93
18	RFI-5 (5-7)	97
19	RFI-6 (3-5)	94
20	RFI-6 (5-7)	102
21	RFI-7 (4-6)	95
22	RFI-7 (6-8)	94
23	RFI-8 (4-6)	96
24	RFI-8 (6-8)	96
25	RFI-9 (4-6)	91
26	RFI-9 (6-8)	104
27	RFI-10 (4-6)	85
28	RFI-10 (6-8)	89
29	RFI-21 (10-12)	98

Project ID #: 44-02                      TPH                      Page 2 of 4  
Project ID Name: SK - Pekin  
SK Lab Project #: 94-053  
Date Reported: 12/1/94

## **SURROGATE COMPOUND RECOVERY**

o-Terphenyl

**Total Petroleum Hydrocarbons as Mineral Spirits in Soil**

Modified EPA Method 8015

Acceptability Limits: 80 - 146

Work Order #	Collector's Sample #	Surrogate Recovery %
30	EOD-6 (0.5-2.5)	108
31	EOD-6 (15.5-17.5)	109
32	EOD-6 (34-36)	109
33	EOD-7 (13-15)	115
34	EOD-7 (34-36)	103
35	EOD-8 (13-15)	105
36	EOD-8 (34-36)	107
37	EOD-9 (34-36)	80
38	EOD-10 (13-15)	109
39	EOD-10 (34-36)	107
40	EOD-2A (5.5-7.5)	107
41	EOD-2A (34-36)	116

Review / Date: \_\_\_\_\_

Project ID #: 44-02  
Project ID Name: SK - Pekin  
SK Lab Project #: 94-053  
Date Reported: 12/1/94

TPH

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**MATRIX SPIKE (MS) &  
MATRIX SPIKE DUPLICATE (MSD) SUMMARY  
PERCENT RECOVERY & RELATIVE PERCENT DIFFERENCE (RPD)  
Total Petroleum Hydrocarbons as Mineral Spirits in Soil**

Modified EPA Method 8015

Acceptability Limits %

RPD: 25

Analyte: SK-105

% Recovery: 80 - 146

Work Order #	Collector's Sample #	Spike Added mg/Kg	Sample Conc. mg/Kg	MS Conc. mg/Kg	MSD Conc. mg/Kg	MS % Recovery	MSD % Recovery	RPD %
07	EOD-5 (32-34)	30.1	0.45	26.33	27.2	86	89	3
09	RFI-1 (4-6)	30.1	0.37	24.59	25.28	80	83	3
39	EOD-10 (34-36)	30.1	0.42	27.44	27.32	90	89	0

Review / Date:

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Project ID #: 44-02  
 Project ID Name: SK - Pekin  
 SK Lab Project #: 94-053  
 Date Reported: 12/1/94

Volatiles

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## SURROGATE RECOVERY SUMMARY

### Volatile Organics in Soil

EPA Method 8240

Work Order #	Collector's Sample #	Percent Recovery			
		S1 (TOL)	S2 (BFB)	S3 (DCE)	TOTAL OUT
01	EOD-1(12-14)	102	96	105	0
02	EOD-3 (10-12)	100	110	114	0
03	EOD-3 (32-34)	103	93	102	0
04	EOD-4 (10-12)	102	104	84	0
05	EOD-4(17.5-19.5)	106	91	116	0
06	EOD-5 (13-15)	102	95	103	0
07	EOD-5 (32-34)	103	95	101	0
08	RFI-1 (2-4)	104	89	102	0
09	RFI-1 (4-6)	101	96	105	0
10	RFI-2 (0-2)	89	84	116	0
11	RFI-2 (2-4)	103	94	116	0
12	RFI-3 (0-2)	102	95	101	0
13	RFI-3 (0-2)	102	102	102	0
14	RFI-4 (0-2)	108	98	109	0
15	RFI-4 (2-4)	106	97	107	0
16	RFI-20 (6-8)	89	70	84	1
17	RFI-5 (3-5)	106	98	104	0
18	RFI-5 (5-7)	97	100	119	0
19	RFI-6 (3-5)	103	100	108	0
20	RFI-6 (5-7)	92	110	105	0
21	RFI-7 (4-6)	110	95	113	0
22	RFI-7 (6-8)	113	92	119	0
23	RFI-8 (4-6)	96	90	102	0
24	RFI-8 (6-8)	105	101	108	0
25	RFI-9 (4-6)	108	87	114	0

Project ID #: 44-02  
 Project ID Name: SK - Pekin  
 SK Lab Project #: 94-053  
 Date Reported: 12/1/94

## SURROGATE RECOVERY SUMMARY

### Volatile Organics in Soil

EPA Method 8240

Work Order #	Collector's Sample #	Percent Recovery			
		S1 (TOL)	S2 (BFB)	S3 (DCE)	TOTAL OUT
26	RFI-9 (6-8)	102	93	110	0
27	RFI-10 (4-6)	104	93	101	0
28	RFI-10 (6-8)	101	97	97	0
29	RFI-21 (10-12)	105	93	106	0
30	EOD-6 (0.5-2.5)	100	98	120	0
31	EOD-6 (15.5-17.5)	102	99	100	0
32	EOD-6 (34-36)	103	111	102	0
33	EOD-7 (13-15)	100	100	114	0
34	EOD-7 (34-36)	104	97	117	0
35	EOD-8 (13-15)	100	105	92	0
36	EOD-8 (34-36)	101	95	121	0
37	EOD-9 (34-36)	99	99	120	0
38	EOD-10 (13-15)	97	82	102	0
39	EOD-10 (34-36)	108	91	118	0
40	EOD-2A (5.5-7.5)	99	102	105	0
41	EOD-2A (34-36)	101	95	103	0

#### Recovery Limits

TOL	Toluene-d8	81 - 117
BFB	Bromofluorobenzene	74 - 121
DCE	1,2-Dichloroethane-d4	70 - 121

Review / Date: \_\_\_\_\_

Project ID #: 44-02  
 Project ID Name: SK - Pekin  
 SK Lab Project #: 94-053  
 Date Reported: 12/1/94

Volatiles Page 3 of 5

## METHOD BLANK SUMMARY

### Volatile Organics in Soil

EPA Method 8240

Lab Blank #	Method Blank	Method Blank	Method Blank	Method Blank	Method Blank	Method Blank
Date Analyzed	8/15/94	8/16/94	8/17/94	8/18/94	8/19/94	8/26/94
Analyte	Concentration mg/Kg					
Acetone	<.005	<.005	<.005	<.005	<.005	<.005
Benzene	<.005	<.005	<.005	<.005	<.005	<.005
Chlorobenzene	<.005	<.005	<.005	<.005	<.005	<.005
1,1-Dichloroethane	<.005	<.005	<.005	<.005	<.005	<.005
1,2-Dichloroethane	<.005	<.005	<.005	<.005	<.005	<.005
1,1-Dichloroethylene	<.005	<.005	<.005	<.005	<.005	<.005
cis-1,2-Dichloroethylene	<.005	<.005	<.005	<.005	<.005	<.005
trans-1,2-Dichloroethylene	<.005	<.005	<.005	<.005	<.005	<.005
Ethylbenzene	<.005	<.005	<.005	<.005	<.005	<.005
Tetrachloroethylene	<.005	<.005	<.005	<.005	<.005	<.005
Toluene	<.005	<.005	<.005	<.005	<.005	<.005
1,1,1-Trichloroethane	<.005	<.005	<.005	<.005	<.005	<.005
Trichloroethylene	<.005	<.005	<.005	<.005	<.005	<.005
Vinyl Chloride	<.005	<.005	<.005	<.005	<.005	<.005
Xylenes	<.005	<.005	<.005	<.005	<.005	<.005

Review / Date:

Project ID #: 44-02

Volatiles

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Project ID Name: SK - Pekin

SK Lab Project #: 94-053

Date Reported: 12/1/94

**MATRIX SPIKE (MS) &  
MATRIX SPIKE DUPLICATE (MSD) SUMMARY  
PERCENT RECOVERY & RELATIVE PERCENT DIFFERENCE (RPD)**

Volatile Organics in Soil

EPA Method 8240

Work Order #: 94-053-08

Collector's Sample #: RFI-1 (2-4)

Analyte	Spike Added mg/Kg	Sample Conc. mg/Kg	MS Conc. mg/Kg	MSD Conc. mg/Kg	MS % Recovery	MSD % Recovery	RPD %	Acceptability Limits %	
								RPD	% Recovery
Benzene	0.050	<.005	0.0487	0.047	97	94	4	20	76 - 127
Chlorobenzene	0.050	<.005	0.0426	0.0408	85	82	4	20	75 - 110
1,1-Dichloroethylene	0.050	<.005	0.0572	0.0538	114	108	6	20	61 - 145
Toluene	0.050	<.005	0.0469	0.0444	94	89	5	20	76 - 125
Trichloroethylene	0.050	<.005	0.0449	0.0425	90	85	5	20	71 - 120

Work Order #: 94-053-13

Collector's Sample #: RFI-3 (0-2)

Analyte	Spike Added mg/Kg	Sample Conc. mg/Kg	MS Conc. mg/Kg	MSD Conc. mg/Kg	MS % Recovery	MSD % Recovery	RPD %	Acceptability Limits %	
								RPD	% Recovery
Benzene	0.050	<.005	0.0507	0.0487	101	97	4	20	76 - 127
Chlorobenzene	0.050	<.005	.0512	0.0493	102	99	4	20	75 - 110
1,1-Dichloroethylene	0.050	<.005	0.056	0.054	112	108	4	20	61 - 145
Toluene	0.050	<.005	0.052	0.05	104	100	4	20	76 - 125
Trichloroethylene	0.050	<.005	0.048	0.0475	96	95	1	20	71 - 120



Project ID #: 44-02

Volatiles

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Project ID Name: SK - Pekin

SK Lab Project #: 94-053

Date Reported: 12/1/94

**MATRIX SPIKE (MS) &  
MATRIX SPIKE DUPLICATE (MSD) SUMMARY  
PERCENT RECOVERY & RELATIVE PERCENT DIFFERENCE (RPD)**

Volatile Organics in Soil

EPA Method 8240

Work Order #: 94-053-27

Collector's Sample #: RFI-10 (4-6)

Analyte	Spike Added mg/Kg	Sample Conc. mg/Kg	MS Conc. mg/Kg	MSD Conc. mg/Kg	MS % Recovery	MSD % Recovery	RPD %	Acceptability Limits %	
								RPD	% Recovery
Benzene	0.050	<.005	0.0499	0.052	100	104	4	20	76 - 127
Chlorobenzene	0.050	<.005	0.0481	0.0508	96	102	5	20	75 - 110
1,1-Dichloroethylene	0.050	<.005	0.0549	0.0563	110	113	3	20	61 - 145
Toluene	0.050	<.005	0.0504	0.0523	101	105	3	20	76 - 125
Trichloroethylene	0.050	<.005	0.0478	0.0494	96	99	3	20	71 - 120

Work Order #: 94-053-29

Collector's Sample #: RFI-21 (10-12)

Analyte	Spike Added mg/Kg	Sample Conc. mg/Kg	MS Conc. mg/Kg	MSD Conc. mg/Kg	MS % Recovery	MSD % Recovery	RPD %	Acceptability Limits %	
								RPD	% Recovery
Benzene	0.050	<.005	0.0502	0.0521	100	104	4	20	76 - 127
Chlorobenzene	0.050	<.005	0.048	0.0497	96	99	3	20	75 - 110
1,1-Dichloroethylene	0.050	<.005	0.055	0.06	110	120	9	20	61 - 145
Toluene	0.050	<.005	0.0521	0.0554	104	111	6	20	76 - 125
Trichloroethylene	0.050	<.005	0.0442	0.0449	88	90	2	20	71 - 120

Review / Date:

Project ID #: 44-02  
 Project ID Name: SK - Pekin  
 SK Lab Project #: 94-053  
 Date Reported: 12/1/94

Metals GFAA QC  
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## METHOD BLANK SUMMARY

### Metals in TCLP Leachate

Lab Blank #:	DB0818		DB0822BP1		DB0822BP2		DB0824		DB0829	
Date Digested:	8/18/94		8/22/94		8/22/94		8/24/94		29-Aug	
Analyte	Date Analyzed	Conc. µg/L	Date Analyzed	Conc. µg/L	Date Analyzed	Conc. µg/L	Date Analyzed	Conc. µg/L	Date Analyzed	Conc. µg/L
Arsenic	8/20/94	<12.5	8/24/94	<12.5	8/24/94	<12.5	8/26/94	<12.5	-	-
Cadmium	8/22/94	<0.4	8/24/94	<0.4	8/24/94	<0.4	8/26/94	<0.4	8/29/94	<0.4
Chromium	8/19/94	<8.31	8/24/94	<8.31	8/24/94	<8.31	8/26/94	<8.31	-	-
Lead	8/25/94	<3.08	8/25/94	<3.08	8/25/94	<3.08	8/29/94	<3.08	8/30/94	4.5*
Selenium	8/25/94	<9.03	8/25/94	<9.03	8/25/94	<9.03	-	-	-	-
Silver	8/26/94	<4.38	8/26/94	<4.38	-	-	-	-	-	-

\* Lead value above PQL, but below reporting limit.

PEKIN - EOD

44-055

## CHAIN-OF-CUSTODY RECORD

Page 1 of 1

Project No.: AA-02		Today's Date: 8/10/94		Date Results Requested: STANDARD T-A-T		Analysis Requested																
Sampler's Name: Tom NISSEN CHARLIE DEWOLF			Phone No.: 307-745-7474		Fax No.: 307-745-7729		MINERAL SPIRITS (8015)	EOD TARGET VOCs (8240)	ACETONE	ETHYL BENZENE	METHYLENE CHLORIDE	XYLENES	EOD TARGET SVOCs (8220)	BIS(2-ETHYLHEXYL) PHTHALATE	DI-N-BUTYL PHTHALATE	ISOPHTHALIC	TCLP METALS	ARSENIC (7060)	CADMIUM (7131)	CHROMIUM (7191)	LEAD (7421)	
Company Name and Address: TriHydro Corporation 410 Grand Avenue Laramie, WY 82070			Company Contact: T. NISSEN, C. DEWOLF J. BEDESSEM			Collector's Sample No.	Sample Matrix	Date Sampled/ Time Sampled	No. of Containers													
11	EOD-1 (12-14)	SOIL	✓	8/9/94 10:45	2 BRASS 1 GLASS	X	X						X				X					
12	EOD-3 (10-12)		✓	8/9/94 1240																		
13	EOD-3 (32-34)		✓	8/9/94 1500																		
14	EOD-4 (10-12)		✓	8/10/94 09:50																		
15	EOD-4 (17.5-19.5)		✓	8/10/94 1005																		
16	EOD-5 (13-15)		✓	8/10/94 1115																		
17	EOD-5 (32-34)		✓	8/10/94 1220																		
Remarks: NOTE TARGET VOCs, SVOCs & METALS LISTED ABOVE - REPORT ONLY THOSE. SEE ATTACHED SHEET FOR REQUIRED TARGET CONCENTRATION LEVELS																						
DIRECT BILL B. SCHOEPPKE, UNDER AUTH # E 10742																						
Relinquished by: Thomas C. Nissen			Affiliation: TriHydro		Date/Time: 8/10/94 1610		Received by: Walter Schmitt			Affiliation: Tech		Date/Time: 8/12/94 11:00										
Relinquished by:			Affiliation:		Date/Time:		Received by:			Affiliation:		Date/Time:										
Relinquished by:			Affiliation:		Date/Time:		Received by:			Affiliation:		Date/Time:										
Were samples received in good condition? B.C.						Remarks:																

SK PEKIN - EOD

94-053 (CONTINUED)

CHAIN-OF-CUSTODY RECORD

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Project No.: AA-02		Today's Date: 8/12/94		Date Results Requested: STANDARD T-A-T		Analyses Requested															
Sampler's Name: Tom NISSEN CHARLIE DEWOLF		Phone No.: 307-745-7474		Fax No.: 307-745-7729		MINERAL SPIRITS (8015)	EOD TARGET VOCs (8240)	ACETONE	ETHYL BENZENE	METHYLENE CHLORIDE	XYLENES	EOD TARGET SVOCs (8270)	BIS(2-ETHYL-HEXYL) PHTHALATE	DI-N-BUTYL PHTHALATE	ISOPHORONE	TCP METALS	ARSENIC (7060)	CADMIUM (7131)	CHROMIUM (7191)	LEAD (7421)	
Company Name and Address: TriHydro Corporation 410 Grand Avenue Laramie, WY 82070		Company Contact: T. NISSEN, C. DEWOLF J. BEDESSEM				Collector's Sample No.	Sample Matrix	Date Sampled/ Time Sampled	No. of Containers												
EOD-6(0.5-2.5)		SOIL		8/11/94 0800		2 BRASS 1 GLASS		X X													
EOD-6(15.5-17.5)				8/11/94 0835		↓		✓													
EOD-6(34-36)				8/11/94 0920		↓		✓													
EOD-7(13-15)				8/11/94 1055		1 BRASS 1 GLASS		✓													
EOD-7(34-36)				8/11/94 1145		1 BRASS 1 GLASS		✓													
EOD-8(13-15)				8/11/94 1400		2 BRASS 1 GLASS		✓													
EOD-8(34-36)				8/11/94 1425		↓		✓													
EOD-9(34-36)		↓		8/11/94 1550		↓		✓													
Remarks: NOTE TARGET VOCs, SVOCs & METALS LISTED ABOVE - REPORT ONLY THOSE. SEE ATTACHED SHEET FOR REQUIRED TARGET CONCENTRATION LEVELS.																					
DIRECT BILL B. SCHOEPKE UNDER AUTH #10742																					
Relinquished by: Thomas Nissen		Affiliation: TRIHYDRO		Date/Time: 8/15/94 0845		Received by: [Signature]		Affiliation: SKH		Date/Time: 8/15/94 - 845											
Relinquished by:		Affiliation:		Date/Time:		Received by:		Affiliation:		Date/Time:											
Relinquished by:		Affiliation:		Date/Time:		Received by:		Affiliation:		Date/Time:											
Were samples received in good condition?				Remarks:																	

PEKIN - EOD

94-053 (Continued)

## CHAIN-OF-CUSTODY RECORD

Page 2 of 1



Project No.: AA-02		Today's Date: 8/12/94		Date Results Requested: STANDARD T-A-T		Analyses Requested																
Sampler's Name: TOM NISSEN CHARLIE DEWOLF			Phone No.: 307-745-7474		Fax No.: 307-745-7729		MINERAL SPIRITS (B015)	EOD TARGET VOCs (B240)	ACETONE	ETHYL BENZENE	METHYLENE CHLORIDE	XYLENES	EOD TARGET SVOCs (B270)	BIS(2-ETHYLHEXYL) PHTHALATE	DI-N-BUTYL PHTHALATE	ISOPHORONE	TCP METALS	ARSENIC (7060)	CADMIUM (7131)	CHROMIUM (7191)	LEAD (7421)	
Company Name and Address: TriHydro Corporation 410 Grand Avenue Laramie, WY 82070			Company Contact: T. NISSEN, C. DEWOLF J. BEDESSEM																			
#	Collector's Sample No.	Sample Matrix	Date Sampled/ Time Sampled	No. of Containers																		
8	EOD-10 (13-15)	SOIL	8/11/94 1050	2 BRASS 1 GLASS	X	X							X				X					
9	EOD-10 (34-36)		8/11/94 1725																			
10	EOD-2A (5.5-7.5)		8/12/94 1215																			
	EOD-2A (3A-36)		8/12/94 1325	2 BRASS 1 PLUS																		
	EOD-2A (32-34)			2 BRASS FROM 32-34 TO BE USED ONLY IF INSUFFICIENT SAMPLE	USE ONLY IF 34-36 IS INSUFF. @ QUANTITY																	
Remarks: NOTE TARGET VOCs, SVOCs & METALS LISTED ABOVE - REPORT ONLY THOSE. SEE ATTACHED SHEET FOR REQUIRED TARGET CONCENTRATION LEVELS																						
E- DIRECT BILL B. SCHOEPKE UNDER AUTH #10742																						
Relinquished by: Thomas C. Nissen		Affiliation: TriHydro		Date/Time: 8/15/94 CBAS		Received by: [Signature]		Affiliation: SK		Date/Time: 8/15/94 845/A												
Relinquished by:		Affiliation:		Date/Time:		Received by:		Affiliation:		Date/Time:												
Relinquished by:		Affiliation:		Date/Time:		Received by:		Affiliation:		Date/Time:												
Were samples received in good condition?				Remarks:																		

SK PEKIN - EOD

## CHAIN-OF-CUSTODY RECORD

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Project No.: <b>AA-02</b>		Today's Date: <b>8/12/94</b>		Date Results Requested: <b>STANDARD T-A-T</b>		ANALYSES REQUESTED																																
Sampler's Name: <b>TOM NISSEN CHARLIE DEWOLF</b>			Phone No.: <b>307-745-7474</b>		Fax No.: <b>307-745-7729</b>		<table border="1"> <tr> <td>TCLP &amp; METALS</td> <td>ARSENIC</td> <td>BARIUM</td> <td>CADMIUM</td> <td>CHROMIUM</td> <td>LEAD</td> <td>MERCURY</td> <td>SELENIUM</td> <td>SILVER</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>												TCLP & METALS	ARSENIC	BARIUM	CADMIUM	CHROMIUM	LEAD	MERCURY	SELENIUM	SILVER											
TCLP & METALS	ARSENIC	BARIUM	CADMIUM	CHROMIUM	LEAD	MERCURY													SELENIUM	SILVER																		
Company Name and Address: <b>TriHydro Corporation 410 Grand Avenue Laramie, WY 82070</b>			Company Contact: <b>T. NISSEN, C. DEWOLF J. BEDESSEM</b>																																			
Collector's Sample No.	Sample Matrix	Date Sampled/ Time Sampled	No. of Containers																																			
42	EOD-9A(0.5-2.5) SOIL	8/11/94 1448	16 GLASS JAR	X																																		
43	BG-1A(0.5-2.5)	8/12/94 0845		X																																		
44	BG-2A(0.5-2.5)	8/12/94 0920		X																																		
45	BG-3(2-4)	8/12/94 1120		X																																		
46	EOD-9(5-7) <del>(2-4)</del>	8/11/94 1455		X																																		
47	BG-1(13-15)	8/12/94 0835		X																																		
48	BG-2(8-10)	8/12/94 0907		X																																		
49	BG-3(18-20)	8/12/94 1030		X																																		
Remarks: NOTE TARGET POCs, SVOCs & METALS LISTED ABOVE - REPORT ONLY THOSE. SEE ATTACHED SHEET FOR REQUIRED TARGET CONCENTRATION LEVELS. THESE ARE BACKGROUND SAMPLES TO BE RUN FOR DIRECT BILL B. SCHOERKE UNDER AUTH # E-10742																																						
Relinquished by: <i>Thomas Nissen</i>		Affiliation: <b>TRIHYDRO</b>		Date/Time: <b>8/15/94 0845</b>		Received by: <i>[Signature]</i>		Affiliation: <b>SK</b>		Date/Time: <b>8/15/94 8:45A</b>																												
Relinquished by:		Affiliation:		Date/Time:		Received by:		Affiliation:		Date/Time:																												
Relinquished by:		Affiliation:		Date/Time:		Received by:		Affiliation:		Date/Time:																												
Were samples received in good condition?				Remarks:																																		



SA PEKIN - EOD

## CHAIN-OF-CUSTODY RECORD

Page 14 of 25

Project No.:		Today's Date:		Date Results Requested:		ANALYSES REQUESTED																	
AA-02		8/12/94		STANDARD T-A-T																			
Sampler's Name:			Phone No.:		Fax No.:																		
Tom NISSEN CHARLIE DEWOLF			307-745-7474		307-745-7729																		
Company Name and Address:				Company Contact:																			
TriHydro Corporation 410 Grand Avenue Laramie, WY 82070				T. NISSEN, C. DEWOLF J. BEDESSEM																			
Collector's Sample No.		Sample Matrix		Date Sampled/ Time Sampled		No. of Containers																	
EOD-9(0.5-2.5)		SOIL		8/11/94 1448		1 GLASS JAR																	
EOD-9(32-34)				8/11/94 1540																			
BG-1(0.5-2.5)				8/12/94 0817																			
BG-1(8-10)				8/12/94 0827																			
BG-2(0.5-2.5)				8/12/94 0900																			
BG-2(13-15)				8/12/94 0912																			
BG-3(0.5-2.5)				8/12/94 0947																			
BG-3(14-16)				8/12/94 1017																			
Remarks: NOTE TARGET VOCs, SVOCs & METALS LISTED ABOVE - REPORT ONLY THOSE. SEE ATTACHED SHEET FOR REQUIRED TARGET CONCENTRATION LEVELS. THESE ARE BACKGROUND SAMPLES TO BE RUN FOR METALS ONLY																							
DIRECT BILL B. SCHOEPKE UNDER AUTH # E-10742																							
Relinquished by:		Affiliation:		Date/Time:		Received by:		Affiliation:		Date/Time:													
Thomas [Signature]		TRIHYDRO		8/15/94 0845		[Signature]		SK		8/15/94 845A													
Relinquished by:		Affiliation:		Date/Time:		Received by:		Affiliation:		Date/Time:													
Relinquished by:		Affiliation:		Date/Time:		Received by:		Affiliation:		Date/Time:													
Were samples received in good condition?				Remarks:																			





APPENDIX E

GROUND-WATER QUALITY DATA  
LABORATORY ANALYTICAL REPORTS  
AND CHAIN-OF-CUSTODY DOCUMENTS  
EXTENT OF DEGRADATION INVESTIGATION  
SAFETY-KLEEN CORP. SERVICE CENTER  
PEKIN, ILLINOIS





September 7, 1994

Mr. Jack Bedessem  
TriHydro Corporation  
920 Sheridan  
Laramie, WY 82070

Re: SK Lab Project #94-055  
Project ID Name: SK Pekin, IL

Dear Jack:

Enclosed please find the revised analytical results for samples received by SK Environmental Laboratory on 8/20/94.

A formal Quality Control/Quality Assurance program is maintained by Safety-Kleen, which is designed to meet or exceed the EPA requirements. Analytical work for this project met QA/QC criteria unless otherwise stated.

If you have any questions concerning this analysis, or if we can be of further assistance, please call Matt Schweik at 312-825-7387.

Sincerely,

Mark A. Hartwig  
Environmental Lab Manager

MAH:jt

cc: Gary Long  
Bob Schoepke

Allan A. Manteuffel Technical Center

Project ID #: 44-02

Metals Page 1 of 1

Project ID Name: Pekin, IL

SK Lab Project #: 94-055

Date Reported: 12/1/94

**ANALYTICAL RESULTS****Dissolved Metals**

Work Order #	01	02	03	04	05	06	07
Collector's Sample #	MW-1	MW-2A	MW-3	MW-4	MW-5	FB819	EB819
Date Sampled	8/19/94	8/19/94	8/19/94	8/19/94	8/19/94	8/19/94	8/19/94
Date Analyzed method 7191	8/29/94	8/29/94	8/29/94	8/29/94	8/29/94	8/29/94	8/29/94
Date Analyzed (EPA Method 7131&7060)	8/29/94	8/29/94	8/29/94	8/29/94	8/29/94	8/29/94	8/29/94*
Date Analyzed (EPA Method 7421)	8/29/94	8/29/94	8/29/94	8/29/94	8/29/94	8/31/94	8/29/94
Analyte	EPA Method	Reporting Limit mg/L	Concentration mg/L				
Arsenic	7060	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Cadmium	7131	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Chromium	7191	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lead	7421	0.0075	<.0075	<.0075	<.0075	<.0075	<.0075

\* As analyzed on 8/30/94

ANALYTICAL REVIEW / DATE:

Project ID #: 44-02  
Project ID Name: Pekin, IL  
SK Lab Project #: 94-055  
Date Reported: 12/1/94

Semi-Volatiles

Page 1 of 1

## ANALYTICAL RESULTS

### Semi-Volatile Organics in Water

EPA Method 8270

Work Order #	01	02	03	04	05	06	07
Collector's Sample #	MW-1	MW-2A	MW-3	MW-4	MW-5	FB819	EB819
Date Sampled	8/19/94	8/19/94	8/19/94	8/19/94	8/19/94	8/19/94	8/19/94
Date Extracted	8/25/94	8/25/94	8/25/94	8/25/94	8/25/94	8/25/94	8/25/94
Date Analyzed	8/29/94	8/29/94	8/29/94	8/29/94	8/29/94	8/29/94	8/29/94
Analyte	Reporting Limit mg/L	Concentration mg/L					
bis(2-Ethylhexyl)phthalate	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Di-n-butylphthalate	0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7
Isophorone	1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4

A. ANALYTICAL REVIEW / DATE:

Project ID #: 44-02  
Project ID Name: Pekin, IL  
SK Lab Project #: 94-055  
Date Reported: 12/1/94

TPH

Page 1 of 1

## ANALYTICAL RESULTS

### Total Petroleum Hydrocarbons as Mineral Spirits in Water

Modified EPA Method 8015

Extraction By EPA Method 3550

Reporting Limit:0.5 mg/L

Work Order #	Collector's Sample #	Date Sampled	Date Extracted	Date Analyzed	Concentration
01	MW-1	8/19/94	8/23/94	8/26/94	<0.5
02	MW-2A	8/19/94	8/23/94	8/26/94	<0.5
03	MW-3	8/19/94	8/23/94	8/26/94	<0.5
04	MW-4	8/19/94	8/23/94	8/26/94	<0.5
05	MW-5	8/19/94	8/23/94	8/26/94	<0.5
06	FB819	8/19/94	8/23/94	8/26/94	<0.5
07	EB819	8/19/94	8/23/94	8/26/94	<0.5

ANALYTICAL REVIEW / DATE:

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Project ID #: 44-02

Volatiles Page 1 of 1

Project ID Name: Pekin, IL

SK Lab Project #: 94-055

te Reported: 12/1/94

## ANALYTICAL RESULTS

### Volatile Organics in Water

EPA Method 8240

Work Order #	01	02	03	04	05	06	07
Collector's Sample #	MW-1	MW-2A	MW-3	MW-4	MW-5	FB819	EB819
Date Sampled	8/19/94	8/19/94	8/19/94	8/19/94	8/19/94	8/19/94	8/19/94
Date Analyzed	8/30/94	8/23/94	8/23/94	8/23/94	8/23/94	8/23/94	8/23/94
Analyte	Report Limit mg/L	Concentration mg/L					
Acetone	0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7
Ethylbenzene	0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7
Methylene Chloride	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Xylenes	10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0

ANALYTICAL REVIEW / DATE:

Project ID #: 44-02

Metals

Page 1 of 2

Project ID Name: Pekin, IL

SK Lab Project #: 94-055

Date Reported: 12/1/94

## INITIAL CALIBRATION VERIFICATION QC CHECK SAMPLE REPORT

### Dissolved Metals

Analyte	Date Analyzed	Expected Result $\mu\text{g/L}$	Observed Result $\mu\text{g/L}$	% Recovery	% Acceptability Limits
Cadmium	8/29/94	5	5.01	100.2	90 - 110
Lead	8/29/94	10	10.3	103	90 - 110
Chromium	8/29/94	50	51.3	102.6	90 - 110
Arsenic	8/29/94	50	52.2	104.4	90 - 110

Analyte	Date Analyzed	Expected Result $\mu\text{g/L}$	Observed Result $\mu\text{g/L}$	% Recovery	% Acceptability Limits
Chromium	9/1/94	50	47.4	94.8	90 - 110
Lead	8/31/94	50	10.9	21.8	90 - 110

Review / Date:

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Project ID #: 44-02  
Project ID Name: Pekin, IL  
SK Lab Project #: 94-055  
Date Reported: 12/1/94

Metals

Page 2 of 2

## SPIKE & DUPLICATE SUMMARY

### Dissolved Metals

#### Acceptability Limits %

Work Order #: 94--055-07

RPD: 20

Collector's Sample #: EB819

% Recovery: 80 - 120

Analyte	Spike Added µg/L	Sample Conc. µg/L	Sample Spike µg/L	MS Conc. µg/L	MS % Recovery	RPD %
Chromium	50	<8.31	<8.31	48.2	96	0
Arsenic	25	<12.5	<12.5	25.3	101	0
Cadmium	5	<0.4	<0.4	5.32	106	0
Lead	5	<3.08	<3.08	5.4	108	0

R. / Date:

Project ID #: 44-02  
Project ID Name: Pekin, IL  
SK Lab Project #: 94-055  
Date Reported: 12/1/94

Semi-Volatiles

Page 1 of 3

## SURROGATE RECOVERY SUMMARY

### Semi-Volatile Organics in Water

EPA Method 8270

#### 4-Methylphenol

Work Order #	Collector's Sample #	Percent Recovery		
		S1 (PHL)	S2 (2FP)	TOTAL OUT
01	MW-1	32	55	0
02	MW-2A	31	54	0
03	MW-3	33	58	0
04	MW-4	29	50	0
05	MW-5	30	53	0
06	FB819	34	59	0
07	EB819	32	55	0

#### Surrogates

S1	PHL	Phenol-d5
S2	2FP	2-Fluorophenol

#### Recovery Limits

24 - 113	10 - 99
-25 - -121	21 - 100

Review / Date:

Project ID #: 44-02  
Project ID Name: Pekin, IL  
SK Lab Project #: 94-055  
Date Reported: 12/1/94

Semi-Volatiles

Page 2 of 3

## METHOD BLANK SUMMARY

### Semi-Volatile Organics in Water

EPA Method 8270

Analyte: 4-Methylphenol

Lab Blank #	Date Extracted	Date Analyzed	Concentration mg/L
EBLK0823	8/23/94	8/29/94	<0.010

Review / Date:

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Project ID #: 44-02  
Project ID Name: Pekin, IL  
SK Lab Project #: 94-055  
Date Reported: 12/1/94

Semi-Volatiles

Page 3 of 3

**MATRIX SPIKE (MS) &  
MATRIX SPIKE DUPLICATE (MSD) SUMMARY**  
**PERCENT RECOVERY & RELATIVE PERCENT DIFFERENCE (RPD)**  
**Semi-Volatile Organics in Water**

EPA Method 8270

Acceptability Limits %

RPD: 20

% Recovery: 27 - 120

Analyte	Spike Added mg/Kg	Sample Conc. mg/Kg	MS Conc mg/Kg	MSD Conc mg/Kg	MS % Recovery	MSD % Recovery	RPD %
Phenol	80	<66	61	56	76	70	10
2-Chlorophenol	80	<66	63	55.7	79	70	12
1,4-Dichlorobenzene	80	<66	60	51	75	64	16
N-Nitrosodipropylamine	80	<66	54	49.6	68	62	8
1,2,4-Trichlorobenzene	80	<66	65	52.4	81	66	21
4-Chloro-3-Methylphenol	80	<66	58	51.5	73	64	12
Acenaphthene	80	<66	36	61.8	45	77	53
4-Nitrophenol	80	<66	77	64	96	80	18
2,4-Dinitrotoluene	80	<66	80	71.33	100	89	11
Pentachlorophenol	80	<66	17	33.1	21	41	64
Pyrene	80	<66	77	63.1	96	79	20

Review / Date:

Project ID #: 44-02  
Project ID Name: Pekin, IL  
SK Lab Project #: 94-055  
Date Reported: 12/1/94

TPH

Page 1 of 3

## SURROGATE COMPOUND RECOVERY

o-Terphenyl

Total Petroleum Hydrocarbons as Mineral Spirits in Water

Modified EPA Method 8015

Acceptability Limits: 80 - 146

Work Order #	Collector's Sample #	Surrogate Recovery %
01	MW-1	89
02	MW-2A	92
03	MW-3	91
04	MW-4	91
05	MW-5	93
06	FB819	108
07	EB819	92
07MS	EB819	93
07MSD	EB819	98

Revised / / Date:

Project ID #: 44-02  
Project ID Name: Pekin, IL  
SK Lab Project #: 94-055  
Date Reported: 12/1/94

TPH Page 2 of 3

## METHOD BLANK SUMMARY

Total Petroleum Hydrocarbons as Mineral Spirits in Water

Modified EPA Method 8015

Analyte: SK-150

Lab Blank #	Date Extracted	Date Analyzed	Concentration mg/L
Blank	8/23/94	8/27/94	<0.5

Review / Date:

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Project ID #: 44-02  
Project ID Name: Pekin, IL  
SK Lab Project #: 94-055  
Date Reported: 12/1/94

Volatiles Page 2 of 3

## METHOD BLANK SUMMARY

### Volatile Organics in Water

EPA Method 8240

Lab Blank #	Method Blank	Method Blank
Date Analyzed	8/30/94	8/23/94
Analyte	Concentration mg/Kg	
Acetone	<.005	<.005
Benzene	<.005	<.005
Chlorobenzene	<.005	<.005
1,1-Dichloroethane	<.005	<.005
1,2-Dichloroethane	<.005	<.005
1,1-Dichloroethylene	<.005	<.005
cis-1,2-Dichloroethylene	<.005	<.005
trans-1,2-Dichloroethylene	<.005	<.005
Ethylbenzene	<.005	<.005
Tetrachloroethylene	<.005	<.005
Toluene	<.005	<.005
1,1,1-Trichloroethane	<.005	<.005
Trichloroethylene	<.005	<.005
Vinyl Chloride	<.005	<.005
Xylenes	<.005	<.005

Project ID #: 44-02  
 Project ID Name: Pekin, IL  
 SK Lab Project #: 94-055  
 Date Reported: 12/1/94

**MATRIX SPIKE (MS) &  
 MATRIX SPIKE DUPLICATE (MSD) SUMMARY**  
**PERCENT RECOVERY & RELATIVE PERCENT DIFFERENCE (RPD)**

**Volatile Organics in Water**

EPA Method 8240

Work Order #: 94-055-01

Collector's Sample #: MW-1

Analyte	Spike Added mg/Kg	Sample Conc. mg/Kg	MS Conc. mg/Kg	MSD Conc. mg/Kg	MS % Recovery	MSD % Recovery	RPD %	Acceptability Limits %	
								RPD	% Recovery
Benzene	0.05	<.005	0.0475	0.0471	95	94	1	20	76 - 127
Chlorobenzene	0.05	<.005	0.0471	0.0468	94	94	1	20	75 - 110
1,1-Dichloroethylene	0.05	<.005	0.0512	0.0511	102	102	0	20	61 - 145
Toluene	0.05	<.005	0.0468	0.0465	94	93	1	20	76 - 125
Trichloroethylene	0.05	<.005	0.0452	0.0451	90	90	0	20	71 - 120

Work Order #: 94-055-02

Collector's Sample #: MW-2A

Analyte	Spike Added mg/Kg	Sample Conc. mg/Kg	MS Conc. mg/Kg	MSD Conc. mg/Kg	MS % Recovery	MSD % Recovery	RPD %	Acceptability Limits %	
								RPD	% Recovery
Benzene	0.05	<.005	0.0503	0.049	101	98	3	20	76 - 127
Chlorobenzene	0.05	<.005	0.0486	0.0476	97	95	2	20	75 - 110
1,1-Dichloroethylene	0.05	<.005	0.0533	0.0511	107	102	4	20	61 - 145
Toluene	0.05	<.005	0.0492	0.0481	98	96	2	20	76 - 125
Trichloroethylene	0.05	<.005	0.0477	0.0449	95	90	6	20	71 - 120

Review / Date:



Project ID #: 44-02  
Project ID Name: Pekin, IL  
SK Lab Project #: 94-055  
Date Reported: 12/1/94

TPH

Page 3 of 3

**MATRIX SPIKE (MS) &  
MATRIX SPIKE DUPLICATE (MSD) SUMMARY  
PERCENT RECOVERY & RELATIVE PERCENT DIFFERENCE (RPD)  
Total Petroleum Hydrocarbons as Mineral Spirits in Water**

Modified EPA Method 8015

Acceptability Limits %

RPD: 25

Analyte: SK-150

% Recovery: 80 - 146

Work Order #	Collector's Sample #	Spike Added mg/Kg	Sample Conc. mg/Kg	MS Conc. mg/Kg	MSD Conc. mg/Kg	MS % Recovery	MSD % Recovery	RPD %
07	EB819	50.8	0	50.64	49.36	100	97	3

Rt / Date:

Project ID #: 44-02  
Project ID Name: Pekin, IL  
SK Lab Project #: 94-055  
Date Reported: 12/1/94

Volatiles

Page 1 of 3

## SURROGATE RECOVERY SUMMARY

### Volatile Organics in Water

EPA Method 8240

Work Order #	Collector's Sample #	Percent Recovery			
		S1 (TOL)	S2 (BFB)	S3 (DCE)	TOTAL OUT
01	MW-1	99	98	102	0
02	MW-2A	102	97	97	0
03	MW-3	102	96	105	0
04	MW-4	100	97	107	0
05	MW-5	100	98	104	0
06	FB819	100	98	105	0
07	EB819	100	98	103	0

#### Surrogates

#### Recovery Limits

S1	TOL	Toluene-d8	81 - 117
S2	BFB	Bromofluorobenzene	74 - 121
S3	DCE	1,2-Dichloroethane-d4	70 - 121

Review / Date:

PEKIN - EOD

## CHAIN-OF-CUSTODY RECORD

Page 1 of 2

Project No: AA-02		Today's Date: 8/1/94		Date Results Requested: STANDARD T-A-T		ANALYSES REQUESTED													
Sampler's Name: Tom Nissen CHARLIE DEWOLF		Phone No.: 307-745-7474		Fax No.: 307-745-7729		VOCs 8246 SVOCs 8270 TPH - Mineral Spirits DISSOLVED METALS													
Company Name and Address: TriHydro Corporation 410 Grand Avenue Laramie, WY 82070		Company Contact: T. NISSEN, C. DEWOLF J. BEDESSEM																	
Collector's Sample No.	Sample Matrix	Date Sampled/ Time Sampled	No. of Containers																
MW-1	WATER	8/19/94 1400	6 Bottles 3 Bottles 3 Vials	X	X	X	X												
MW-2A		8/19/94 1415	6 Bottles 3 Bottles 3 Vials	X	X	X	X												
MW-3		8/19/94 1345	6 Bottles 3 Bottles 3 Vials	X	X	X	X												
MW-4		8/19/94 1430	6 Bottles 3 Vials 3 Bott	X	X	X	X												
MW-5		8/19/94 1445	6 Bottles 3 Bott 3 Vials	X	X	X	X												
FB 819		8/19/94 1315	3 Bott 3 Vial	X	X	X	X												
EB 819	✓	8/19/94 1330	3 Bott 3 Vial 2	X	X	X	X												
Remarks: NOTE TARGET VOCs, SVOCs & METALS LISTED ABOVE - REPORT ONLY THOSE. SEE ATTACHED SHEET FOR REQUIRED TARGET CONCENTRATION LEVELS - on attached sheet Note: Attached Constituent List + Detection Limit DIRECT BILL B. SCHOEPRKE UNDER AUTH # same as soil																			
Relinquished by: [Signature]		Affiliation: TriHydro		Date/Time: 7/23/8/19		Received by: [Signature]		Affiliation: 8/19		Date/Time:									
Relinquished by:		Affiliation:		Date/Time:		Received by:		Affiliation:		Date/Time:									
Relinquished by:		Affiliation:		Date/Time:		Received by:		Affiliation:		Date/Time:									
Were samples received in good condition?				Remarks:															

